REPORT RESUMES

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PROGRAMED INSTRUCTION FOR SUPERIOR STUDENTS IN SMALL HIGH SCHOOLS.

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SUPERIOR STUDENTS IN RURAL HIGH SCHOOLS WERE GIVEN PROGRAMED INSTRUCTION IN SELECTED SUBJECT AREAS TO DETERMINE IF A NONDIRECTIVE METHOD OF DIFFUSING AN INNOVATION, LIKE PROGRAMED INSTRUCTION, WAS APPROPRIATE FOR DISSEMINATION IN A RURAL ENVIRONMENT. THE EFFECTS OF THE COOPERATIVE DEMONSTRATION PROJECT ON STUDENTS, PARENTS, TEACHERS, AND HIGH SCHOOL ADMINISTRATORS WERE MEASURED BY THE ATTITUDE TOWARD PROGRAMED INSTRUCTION INVENTORY AND THE SEMANTIC DIFFERENTIAL SCALE. RESULTS SHOWED THAT PREDISPOSITION OF THE INDIVIDUAL TO EITHER ADOPTION OR REJECTION WILL AFFECT THE RATE AND FINAL DECISION REGARDING THE ACCEPTANCE OR REJECTION OF THE INNOVATION. THE INVESTIGATOR RECOMMENDED THAT PREMEASURES SHOULD BE EMPLOYED TO DETERMINE THE PREDISPOSITION OF THE TARGET POPULATION AND CONCLUDED THAT THE NONDIRECTIVE METHOD OF DIFFUSING AN INNOVATION WAS APPROPRIATE FOR THE DISSEMINATION OF PROGRAMED INSTRUCTION IN A RURAL ENVIRONMENT. THE USE OF NEWSLETTERS PROVED TO BE AN IMPORTANT CONTRIBUTION TO THE SUCCESS OF THE PROJECT, AND WHERE DISSEMINATION IS AN OBJECTIVE, THE INVESTIGATOR RECOMMENDED THE USE OF SIMILAR MEANS OF COMMUNICATION WITH THE TARGET AUDIENCE. (GD)

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Programed Instruction for Superior Students in Small High Schools

MARCH 1967

U. S. Department of
HEALTH, EDUCATION and WELFARE

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PROGRAMED INSTRUCTION FOR SUPERIOR STUDENTS IN SMALL HIGH SCHOOLS

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AUTHORS

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Clarion State College
Clarion, Pennsylvania
and
Slippery Rock State College
Slippery Rock, Pennsylvania

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CHAPTER I

INTRODUCTION

The need for the development of methods and techniques to expand and enrich the curriculum in rural schools has been an area of investigation for many years. The recommendation made by Conant has served as a basis for the reorganization of many rural school districts. The multitude of problems associated with the consolidation of a school district, however, were not anticipated by Conant.

> His major concern: The enrollment of many American public high schools is to allow a diversified curriculum except at exorbitant expense. The prevalence of such high schools...those graduating classes of less than 100 students...constitutes one of the serious obstacles to good secondary education throughout most of the United States.[1]

The additional demands that have been placed on the rural school districts as a result of the reorganization have required additional funds for staffing and training. The recruitment of new personnel and the inservice training of existing staff in many school districts exceeded the ability of the school districts to meet the demands and solve the problem.

In addition, the response of the families in Appalachia, regarding the reorganization of the school districts and consolidation of the one-room school houses to regional schools, has been negative. The small one-room schools served as a vehicle of communication with friends and the "outside" world. The abolition of these schools has driven many of these parents away from the large comprehensive high school meetings and a breakdown in communication has occurred. The schools in this region have been accurately described by Coles: "The school is for many of the people located in rural-agrarian or rural-industrial areas, the means whereby families come to know one another."[2]

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[1] James B. Conant, The American High School Today, (New York: McGraw Hill, 1959), p. 77.

[2] Robert Coles, Some Children the Schools Have Never Served, (Saturday Review, June 18, 1966), pp. 58-59.

There is little doubt that the needs of students, parents, teachers, and school administrators in these rural-agrarian and rural-industrial areas have increased with every technological innovation. These regions are not unlike the small underdeveloped countries in the world that have been left behind in the space age and the second industrial revolution.

The National Defense Education Act provided monies for the improvement of the situation with which the educational leadership in these communities was confronted. The local educational leadership, aware of the increased availability of instructional materials and the many other educational innovations responded positively to the administrative staffs of Clarion State and Slippery Rock State College, requests to participate in a cooperative demonstration project.

A. Purpose

The project was designed to describe the effects of the cooperative demonstration project on students, their parents, teachers and high school administrators; to help create an awareness to the many new instructional techniques available; and to augment the existing instructional materials in rural and semi-rural high schools in Pennsylvania. The observed and reported need of curriculum enrichment and supplementary materials for exceptional students by supervisors of student teaching and placement within the state colleges have indicated that the lack of enrichment materials was both general and widespread throughout the state.

Programed instruction has emerged as one of a number of methods by which able students in any high school setting may profit from expanded and/or enriched educational content. These self-teaching materials have become a primary means whereby a student may proceed beyond the usual class pace.

Any educational innovation, bringing with it solutions to some problems, is liable to create additional difficulties. Programed instruction has been used in many schools throughout the country. The effects of the introduction of this technology has been both positive and negative. Problems of learner achievement and motivation, classroom structure, and curriculum development have been reported by Gotkin and Goldstein.[3]

One of their major conclusions is: "By enabling students to proceed independently, and at their own pace, programed instruction does break the traditional lock-step of classroom procedure. In breaking the lock-step, it makes an enormous stride forward in individualizing instruction."[4]

---

[3] L. G. Gotkin and L. S. Goldstein, "Programmed Instruction in the Schools: Innovation and Innovator," Innovation in Education, (Teachers College, Columbia University, New York: Matthew Miles ed. 1964), pp. 231-247.

The natural tendency of any community to resist educational change has been well documented by Mort,[5] Keppel[6] and Bright.[7] It was for the many reasons described in the literature that the design of this project was structured. Similarly the description of the investigating, recording, evaluating and the reporting of the effects of this project has been accomplished with emphasis on both the process and product of the programed instructional materials.

B. Rationale

The use of programed instructional materials and other technological media has emerged as acceptable methods for the instruction of students and adults as a result of the recent federal legislation supporting educational programs.

The finding of a survey questionnaire regarding the use of programed instruction in 609 member colleges in The American Association of Colleges for Teachers Education indicated vigorous interest and revealed that activities in the area of programed instruction were national in scope. Concern centered around (a) developing a theory of its most efficient use, (b) applying it in a more immediate way to the teaching job, and (c) helping teachers and prospective teachers become "knowledgable about the materials, processes, products and problems."[8]

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[4] Ibid., pp. 246-247.

[5] Paul R. Mort, "Studies in Educational Innovation from the Institute of Administrative Research: An Over," Innovation in Education. (Teachers College, Columbia University, New York: Matthew Miles ed., 1964), pp. 317-329

[6] Francis Keppel, The Necessary Revolution in American Education. (New York: Harper and Row, 1966), p. 119

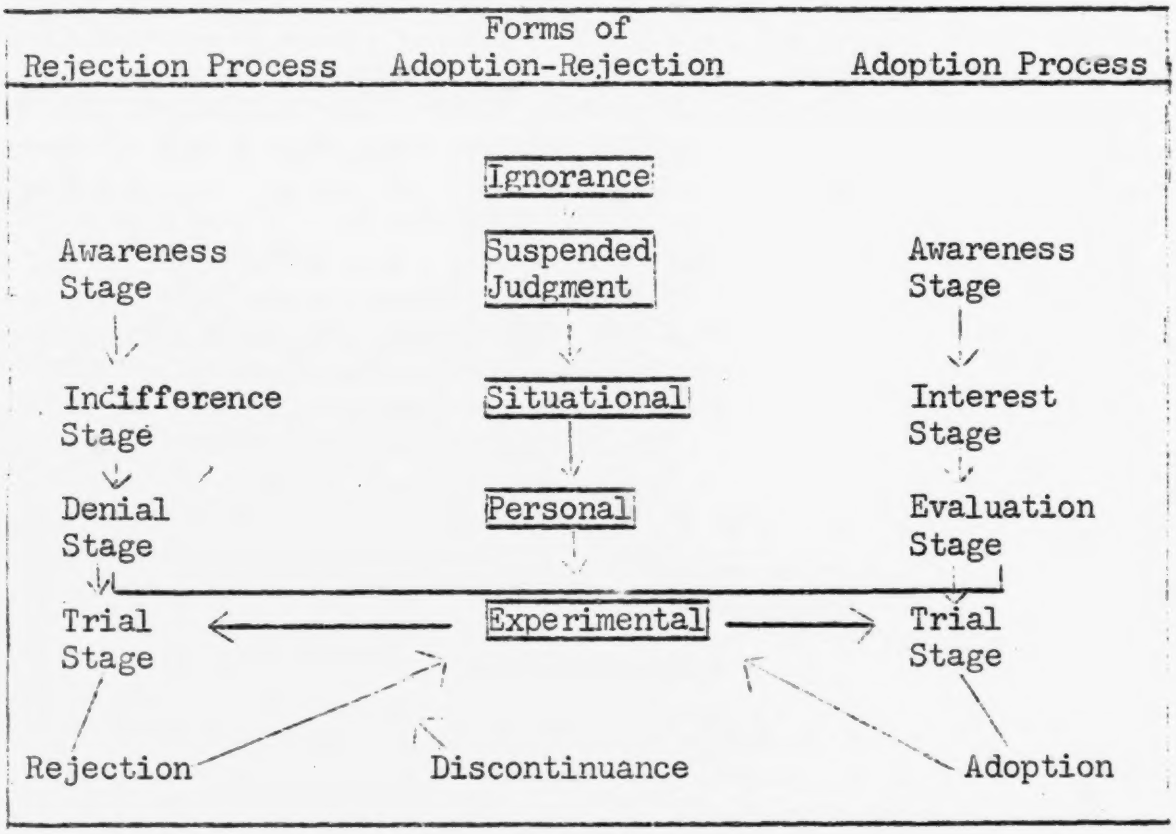
[7] [Dr. Richard Louis Bright], "Automation and Technology in Education," A Report of the Subcommittee on Economic Progress of the Joint Economic Committee Congress of the United States, (Washington: August, 1966), p. 4.

[8] American Association of Colleges for Teacher Education. "Survey of Programmed Instruction in Teacher Education 1963". A report by the Subcommittee on Instructional Media and Teacher Education of the Committee on Studies. (Washington: The Association, a Department of The National Education Association, 1963), p. 32.

The adoption or rejection of an innovation by a population of teachers is dependent upon many variables and conditions. A prototype study of acceptance and rejection by Eichholz and Rogers shows that regardless of the fate of the innovation a five-step process evolves. Their study was based on a similar study conducted by North Central Regional Rural Sociology Subcommittee 1955. This committee described the five stages of an adoption on an innovation: (1) awareness (2) interest (3) evaluation (4) trial (5) adoption.[9] Eichholz and Rogers evolved a theory or rejection, based on the five stages, compared the results of their findings and revised the theory. Figure 1[10] shows the revised rejection theory.

Figure 1

Diagram of Revised Rejection Theory


Rejection Process
Forms of Adoption-Rejection
Adoption Process
Ignorance
Awareness Stage
Suspended Judgment
Awareness Stage
Indifference Stage
Situational
Interest Stage
Denial Stage
Personal
Evaluation Stage
Trial Stage
Experimental
Trial Stage
Rejection
Discontinuance
Adoption

Eichholz and Rogers suggest that the time differential in adoption or rejection can be explained in part "by the forms and stages of adoption-rejection. These forms (ignorance, suspended judgment, situational, personal, and experimental) are directly related to the stages found in both the adoption and rejection process." They conclude that "The time at which any given individual becomes an actual adoptor or rejector will depend on two factors: (1) how quickly he passes through the forms of adoption or rejection, and (2) the predisposition of the individual to either the adoption or rejection process."[11]

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[9] G. Eichholz and E. Rogers, "Resistance to the Adoption of audio-visual aids by elementary school teachers: contrasts and similarities to agricultural innovation." Innovation in Education. (Teachers College, Columbia University, New York: Matthew Miles ed. 1964), p. 303

[10] Ibid., p. 311

The theoretical rationale described by Eichholz and Rogers was employed in the implementation of this project, Programed Instruction for Superior Students in Small High Schools. It was conjectured that the process of adoption and rejection would be the same for all of the sub-groups in the sample. The experiences that were planned for students, teachers, administrators and parents were designed to create a positive effect and lead each sub-group through the five-stage adoption rather than rejection process. The demonstration project began in June, 1964, and was completed June, 1966. The basic axioms that were employed in the implementation and diffusion of programed instruction materials in the demonstration project were:

1. The implementation of an educational innovation must be accomplished in an orderly manner with a maximum amount of participation on the part of the local community staff members (teachers and school administrators), students and parents, and a minimum amount of pressure by the outside agents of change (innovators).

2. The students must be motivated to participate without receiving additional academic credit.

3. The teachers must be exposed to programed instruction materials in a non-threatening atmosphere.

4. The parents of the students must receive information through an objective media that helps to explain programed instruction.

5. Finally, the administrators should become aware and accept programed instruction materials as a productive method of enriching the curriculum and providing for the exceptional high school student.

These axioms provided the basis from which the objective of the demonstration project was conceived.

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[11] Eichholz and Rogers, op. cit., p. 313

The major objective of the demonstration project was to investigate, record, evaluate, and report the impact of a carefully planned and implemented program, and to introduce and/or expand instruction within selected public high schools.

In order to adequately describe the scope and sequence of the project and fulfill the major objective of the project, answers to the following questions were sought:

1. What were the significant differences in the characteristics between the adoption group of students (completed program) and the rejection group of students (non-completed program)?

2. Did more teachers accept than reject programed instruction materials and what were their reactions to the materials introduced?

3. What were the parents' reactions to the use of programed instruction materials?

4. Were the school principals adoptors or rejectors of the innovation?

5. Is a nondirective method of diffusing an innovation (programed instruction) appropriate for dissemenation in a rural environment?

CHAPTER II

METHOD AND PROCEDURE

A. Sample

The demonstration project lasted for 24 months. During this period, a total of 1,634 students in grades 10 through 12, 20 teachers, 358 parents, and 30 administrators participated in the study. There were two phases of the project. Phase I emphasized the involvement of the students and Phase II involved parents, teachers and administrators, in addition to the students.

Phase I included only superior students, and Phase II was designed to include both superior and average students. Table 1 shows the total number of girls and boys in grades 10, 11, and 12 participating in the demonstration project.

TABLE 1.--Number of girls and boys in grades 10, 11 and 12 participating in the demonstration project

	Phase 1	Phase II	Total
Boys	174	216	390
Girls	260	384	644
Total	434	600	* 1034

. *In addition, there were 600 students of average ability who participated in the second phase of the study.

1. Selection of schools and students for Phase I

Twenty small high schools were invited to participate on the basis of their size (less than 200 in the graduating class), type of community environment (rural) and geographic location. Ten high schools that were situated in the immediate service area of each of the two cooperating state colleges were invited to participate. They were requested to file letters of intent to participate with the respective state colleges.

There were twenty high schools invited to participate and all accepted. Administrators of these high schools were asked to nominate twenty superior students in grades 10, 11 and 12.

The criteria used to select the students were: (1) achievement, (2) ability, (3) teacher recommendation, (4) administrator approval, and (5) research assistant approval. Parent (or guardian) consent was obtained after the preliminary approval of school and project officials.

2. Selection of Schools and Students for Phase II

High schools that participated in Phase I were given priority if they elected to continue in the project. In addition, ten more high schools in the geographic region were selected to bring the total to thirty.

Superior students, selected to participate in the first phase of the project, were offered an opportunity to continue in the second phase. An additional sample of superior students, identified by the same selection process employed in the first phase, was used in the second phase.

A second group of 600 students from the thirty participating schools were selected from grades ten and eleven on a class-wide basis within each of the individual schools. A special effort was made to obtain student classes which were considered average or were average in ability and performance.

3. Selection of Teachers, Parents, Administrators and Other Participants

The teachers, parents and administrators who participated came from the geographic region and were members of the faculty or parents of the students in the thirty high schools which were selected. Only the parents of the students in the sample were included in the project.Only the teachers selected and the principals of the thirty high schools were included in the survey.

The teachers of the "average" students in the project were selected by the high school principals. They served as the teacher sample that was administered the pre- and post-Semantic Differential Inventory and the Teacher Questionnaire.

All the students, teachers, parents and individuals using the library materials in the thirty high schools within the geographic region were included as a sample for the Library Programed Materials Inventory.

B. Data Gathering Instruments

There were a variety of instruments employed to gather the data to describe the process and the product of the demonstration project.

Standardized tests, locally constructed questionnaires, attitudinal measures and anecdotal records provided the basis of the evaluation. A description of each of the instruments that was used to collect data on students, teachers, parents and administrators follows:

1. Students

   a) California Test of Mental Maturity, Short Form B

      This instrument is one of the most widely accepted current tests. It has an unusual variety of items, good format and standarization, and a continuous series of levels with separate "language" and "non-language" I.Q.'s.[1]

   b) Iowa Silent Reading Test (Revised) Form A.M.

      The Iowa Silent Reading Test is an analytical diagnostic test which measures comprehension, directed reading, poetry comprehension, word meaning, sentence meaning, paragraph comprehension, location of information, use of index and selection of key words.

   c) Scholastic Aptitude Test - College Entrance Examination Boards

      The Scholastic Aptitude Test measures the basic verbal and mathematical abilities that a student has acquired over many years both in and out of school. It tests his ability to reason rather than to remember facts, and it does not require special preparation. Its verbal sections emphasize the ability to read with understanding and to reason with verbal material. Its mathematical sections, which contain various kinds of problems to be solved, stress reasoning ability rather than knowledge of specific courses in secondary school mathematics.[2]

   d) Attitude Toward Programed Instruction Inventory

      A special inventory developed by C. M. Lindvall, Associate Director, Learning Research and Development Center, University of Pittsburgh, under a United States Office of Education Grant. Twelve items were selected from this instrument and students were asked to respond on a five point scale: strongly agree, agree, undecided, disagree or strongly disagree.

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[1] Lee Cronbach, Essentials of Psychological Testing (2nd Ed.; Harper and Brothers, New York, 1960), p. 229

[2] College Board Score Reports, A Guide for Counselors and Admission Officer,(College Entrance Examination, Princeton, New Jersey, 1964), p. 19

e) Mathematics Attitude Scale

"How I feel about mathematics" is a twenty-item scale designed by W. H. Dutton, Education Professor at the University of California, Los Angeles. The student is given twenty questions regarding mathematics and is asked to answer "yes" or "no" to each question.

f) Quality Point Average

This was the average of all subjects that the student had been enrolled to date.

g) Students' Questionnaire

A questionnaire obtaining information regarding the type of programed instruction material used; the time schedule followed; the number of tests taken; the number of forms completed; of what value programed instruction has been; the advantages, the disadvantages and whether the student has completed the program.

h) Anecdotal Record

A record maintained by the project's research assistants of the students' reactions and behavior as it relates to the program. It consisted of a large accumulation of incidents and statements which were considered to be significant and descriptive of the behavior and attitudes of the participants.

2. Teachers

a) Semantic Differential Inventory

The semantic differential's development and use has been described by Osgood, Suci and Tannenbaum. It consists of a number of graphic, seven "unit" rating scales with opposing, or "bipolar" adjectives at each end. Each semantic scale...is assumed to represent a straight line function that passes through the origin of this space, and a sample of such scales then represents a multidimensional space.[3] Factor analyses have yielded three dimensions of meaning: evaluation, potency, and activity. Evaluation accounts for approximately twice that of any subsequent factors. Concepts dealing with programed instruction were included in the instrument and teachers were asked to respond to evaluative, active and potency stimulus items.

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[3] C. E. Osgood, G. J. Suci, and P. H. Tannenbaum, The Measurement of Meaning, (Urbana: University of Illinois Press, 1957), p. 25

b) Teacher Questionnaire

The teacher questionnaire was designed to obtain information concerning: programed instruction materials that were used; advantages and disadvantages of programed instruction; source of information and knowledge.

c) Library Programed Material Inventory

This was an inventory designed to obtain information concerning the purpose of use on the part of students, teachers, and administrators and to what extent the purpose was fulfilled.

3. Parent's Questionnaire

The parent's questionnaire was an eight-item instrument designed to obtain information from parents regarding their knowledge and attitude toward programed instruction.

4. Principal's Questionnaire

The principal's questionnaire obtained information concerning the administrator's attitude on appropriate ability, types of courses, class organization and supervision of programed instruction materials. In addition, information concerning whether principals favored offering courses for credit was obtained.

C. Materials

There were three methods of diffusing programed instruction materials to the subgroups in the project. The students that participated had a total of six different programed instruction texts from which they could choose. The twenty teachers in the sample that were administered the Semantic Differential and the Teacher's Questionnaire had seventy-four different programed instruction texts. These texts were also made available to the faculties, students, parents and other users of the library in the thirty schools.

Table 2 shows the titles of the six programed instruction materials and the number of tests used by the superior students selected to participate.

The seventy-four programed instruction materials that were placed in the libraries appear in Appendix R.

TABLE 2.--Programed instruction materials, number of tests and publisher used in Phases I and II of the project

TEXT	NO. OF TESTS	PUBLISHER
Introduction to		
Genetics	23 tests and no final	McGraw-Hill
Human Behavior*	4 tests and final	McGraw-Hill
Sets, Relations and Functions	4 tests and final	McGraw-Hill
Social Behavior	3 tests and final	McGraw-Hill
Spelling Improvement	12 tests and final	McGraw-Hill
Introductory Descriptive*		
Statistics	5 tests and final	Encyclopedia-Britannica Press

*These texts were used in Phase I.

D. Analysis of Data

1. Students

The analysis of the data that was gathered for the student population was performed with two major considerations. The first was mainly concerned with the students' performances in the program instruction texts, while the second consideration placed emphasis on how the students felt about their experiences.

A description of the number completing the program text in each area by sex was accomplished for both Phase I and II. In addition, demographic data on each of the students was gathered and was used in the description of the sample.

In Phase I, data on the number of unit tests completed for the two programed texts used was maintained. A test of mathematics attitude was administered to measure the student's attitude toward mathematics. This was necessary due to the nature of the programed instruction material that was offered (statistics) and emphasized in Phase I of the project.

In Phase II, a random sample of 89 student tests was chosen for factor analysis to determine the factor structure of the 12 items on Lindvall's attitude toward Program Instruction Inventory.

This instrument was used to measure the student's attitude toward programed instruction.

Data on the number of unit tests completed in Phase II was maintained and information concerning the number of students completing each test is reported.

Means and standard deviations on a selected number of variables were computed for the students who completed and did not complete the course in programed instruction for both phases.

A single classification analysis of variance and a Bartlett's test were performed on each of these variables to determine if there was a difference between the two groups (completed - not completed).

A two-way classification analysis of variance was performed on two selected variables that were identified as being significant from the results of the single-classification analysis of variance.

These variables were Grade Placement and Attitude Toward Program Instruction Inventory. The two-way classification was accomplished by using the completion vs. noncompletion groups and dividing them into high-low categories on the California Mental Maturity Language score.

The student questionnaire (Phase II) was tabulated. In addition, frequencies and percents for total time devoted to programed instruction, number of tests taken, value of programed instruction, advantages and disadvantages were computed.

2. Parents

A total of 358 (62%) of the parents surveyed responded to the parent's questionnaire. The response of the parents to each of the eight questions was tabulated and the percent answering in each category was computed.

There were 36 parents who signed their names to the questionnaire. The questionnaire was not designed to obtain information by name concerning the parent's attitude. It was decided that the total number that signed their names was sufficient to perform an analysis to determine if there was a significant difference between parents that signed their names and for parents that did not sign their names. If there was no difference, the results of the analysis could be used with other variables or as a variable for analysis along with the teacher and student data.

The first question on the questionnaire served as a method of dividing the parent sample (signed and unsigned names) into groups: those that heard about programed instruction before the project, as a result of the project and others.

A single classification analysis of variance and a Bartlett's test were performed on each of the seven questions (i.e. each question was treated as a dichotomous variable). This was accomplished for both the signed questionnaire group and the unsigned group. Then a comparison between groups was made to determine if there was a significant difference between the signed and unsigned questionnaire for each of the seven questions.

Each question was treated separately with no-option responses deleted from the analysis. Only the parents' responses that were yes or no to each question were analyzed. This made it necessary to perform the analysis of the questionnaire with unequal numbers for each group.

3. Principals' Questionnaire

There was a total of 30 principals surveyed in Phase II. Twenty-eight of the 30 (93%) responded to the questionnaire. Frequencies and percents for each of the seven questions asked were computed and tables were constructed.

4. Teachers' Questionnaire and Semantic Differential Inventory

There was a total of twenty-one teachers in Phase II that completed a pre-Semantic Differential Inventory. In addition, a teacher questionnaire was administered along with the semantic differential inventory at the end of the project. A test of differences was accomplished on each of the three subscales on the Semantic Differential Inventory, evaluation, activity, and potency.

The responses of the teachers to the fifteen questions were computed.

E. Statistical Treatment of the Data

The statistical treatment of the data gathered on the students, parents, teachers and administrators was primarily accomplished using the facilities of the Clarion State College Computer Center. The statistical programs used included means and standard deviations, analysis of variance, Bartlett's test, Pearson Products, Moment Correlations, the principal-axis method of factor analysis and the varimax method of rotating factors.

Winer,[4] Guilford,[5] and Harman[6] were used as references for the statistical designs employed. For example, the factor analysis was performed twice, once with unities in the diagonal and then with the new estimates of communality. The decision as to when to stop factoring described by Harman[7] was used (i.e. after 75% or more of the total variance was accounted for, and any additional factor accounted for less than 5%).

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[4] B. J. Winer, Statistical Principles in Experimental Design, (New York, McGraw-Hill Book Company, 1962), pp. 46-224

[5] J. P. Guilford, Fundamental Statistics in Psychology and Education, (4th Ed., New York, McGraw-Hill Book Company, 1965), pp. 91-112

[6] Harry Harman, Modern Factor Analysis, (University of Chicago Press, 1960), pp. 154-192

F. General Procedure

The procedure that was developed to implement the diffusion of the programed instruction materials in the region was designed to be consistent with the basic axioms described in the rationale. These axioms were:

1. The implementation of an educational innovation must be accomplished in an orderly manner with a maximum amount of participation on the part of the local community, staff members (teachers and school administrators) and students, and a minimum amount of pressure by the agents of change. (innovators)
2. The students must be motivated to participate without receiving additional academic credit.
3. The teachers must be exposed to programed instruction materials in a nonthreatening atmosphere.
4. The parents of the students must receive information regarding programed instruction.
5. Finally, the administrator must become aware and accept programed instruction materials as a productive method of enriching the curriculum and providing for the exceptional high school student.

The five subgroups were studied over a two year period, they were comprised of students, teachers, parents, administrators and users of the programed instruction materials placed in the library. All of the subgroups were involved in Phase II of the project. Only the students participated in both phases.

1. Students

In the first year, 434 students in grades 10 through 12 were chosen from Pennsylvania high schools within the region embraced by Butler, Forest, Jefferson and Lawrence Counties.

The schools were divided into two geographic areas, and research assistants were assigned to one of the areas from Clarion State College and one from Slippery Rock State College.

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[7] *Ibid.*, pp. 363

A project coordinator was selected by the principal of each participating school to help the research assistant collect data for each student from school files, to administer tests and to help the student when requested to do so.

Under the direction of the project coordinators, all participating students in the first year responded to the Mathematics Attitude Scale, the Attitude Toward Programed Instruction Inventory and the California Test of Mental Maturity. If they desired, they took the unit tests provided with the text. Quality point averages and the results of the California Test of Mental Maturity were furnished by the project coordinators for all the students. College Entrance Examination Board scores were collected when they were available.

In the first semester of the first year, the students were given Introductory Descriptive Statistics with instructions to work independently outside of regular class time. Although the project coordinator was available for help, there was to be no compulsion and no reward in the form of school credit. Each student was provided an opportunity to confer with the research assistant from the project staff every two weeks. These conferences were scheduled in advance on a regular basis. If any student required additional help which his liaison teacher could not provide, a special effort was made to schedule a conference with the research assistant between regular visits.

The unit (achievement) examinations which comprised a part of the programed course were spaced according to units of work completed by the individual. Administration of each test was the result of the student's request to his project coordinator, and the test was forwarded to the respective college for scoring. The test was then returned to the student.

In the second semester of Phase I, the above procedure was repeated with the exception that Human Behavior was substituted for the course in Introductory Descriptive Statistics.

All students participating in Phase I of the project were given Certificates of Honor, if they completed at least one test, in either of the two texts employed in the project.

In Phase II Certificate of Completion was issued to each student who completed the programed text that he voluntarily selected during the fall. A copy of the Certificate of Honor and the Certificate of Completion appear in Appendix A.

In the second year, (Phase II) students from Pennsylvania high schools in Armstrong, Beaver, Mercer and Warren Counties were added to the project. The 600 students chosen the second year were selected using the same criteria employed the first year (Phase I).

The general procedure established during Phase I of the project for working with the students and schools was continued in Phase II.

The increased number of schools required that the region be divided into three areas: "A", "B", and "C". The schools, their chief school administrators and high school principals along with the schools' project coordinators, and research assistants are listed in Appendix T.

The number and types of programed instruction materials increased from two in Phase I to six in Phase II. They were Introductory Descriptive Statistics and Human Behavior in Phase I and Sets, Relations and Functions; Introduction to Genetics; Spelling Improvement; Social Behavior; Human Behavior; and Introductory Descriptive Statistics in Phase II.

2. Teachers

The involvement of teachers in Phase I of the project was primarily indirect. They did not formally participate in any project activities. Any information regarding the project was obtained vicariously.

In Phase II a more direct involvement of teachers with programed instruction materials was planned. There were two nonthreatening exposures to the material which were provided by the project administrator. The first involved the voluntary use of programed instruction materials in selected classes. The total sample selected for this exposure consisted of twenty-one teachers. These teachers were identified by their school principals. Their participation in the project and the use of programed instruction in their classrooms with average students was voluntary. Programed instruction materials were given to the teachers to use in conjunction with their classes or in any way that they desired. The list of materials that were made available for classroom use appears in Appendix Q.

A pre- and post-testing of the Semantic Differential Inventory concerning programed instruction was administered to these twenty-one teachers. In addition, when the program was completed, the teachers responded to a questionnaire designed to determine whether or not they felt the program text was successful and how the material should best be utilized.

The second nonthreatening exposure employed in the diffusion of programed instruction material by the project administrator was to place a variety of programed materials in the school library. This expanded exposure of the materials provided information about how these materials were being used and how effective they were viewed by teachers. In addition, the teachers, students, parents and school administrators also had an opportunity to review and try these materials.

3. Parents

The parents of the students involved in the project received information in three ways about programed instruction materials: by discussion with their children, by reviewing the programed instruction materials in the school library, and through the project organ, Title VII B News Notes.

During Phase I the primary source of information for the parents was their children. Phase II provided the two additional methods: library use and the News Notes. There were three copies of the Title VII B News Notes published, January 1966, March 1966 and July 1966. These publications described information about the project and programed instruction material. The publications appear in Appendix J.

4. Administrators

The activities and involvement of the administrative personnel in each school were limited. There were no scheduled activities planned for the school officials in either phase. The research assistants were the prime agents of change in the environment to the degree they provided a positive effect. A questionnaire was administered to the principals of the participating schools. The major question asked was whether they wanted to continue the use of programed instruction materials in their schools.

The gathering of data on the four subgroups studied was accomplished over a two-year period. The significant events in the gathering of this data for Phase I and Phase II are summarized and described in figure 2.

Figure 2

Summary of Significant Events in Gathering Data for Phases I and II

Sub-group	PHASE I (1965) Events	Date	PHASE II (1966) Events	Date
Students	1. Selection of Sample	10-15-64	1. Selection of Sample	9-27-65
	2. Testing of Sample a) attitude toward programed instruction b) standardize tests c) attitude toward mathematics	 12-1-65 3-15-65 12-1-64	2. Testing of Sample a) attitude toward programed instruction b) standardize tests	 12-1-65 3-31-66
	3. Collection of demographic data and anecdotal records	6-1-65	3. Collection of demographic data and anecdotal records	6-5-66
	4. Distribution of programed instruction materials -- Statistics Human Behavior	11-11-64 2-10-65	4. Distribution of programed instruction materials, six different texts	11-15-65
Teachers	Collection of data for anecdotal record.	6-66	1. Selection of Sample 2. Pre-Testing Semantic Differential Inventory 3. Post-Testing Semantic and teacher questionnaire 4. Placement of programed instruction materials in library for teacher and student use.	10-26-65 1-17-66 6-5-66 2-25-66
Principals	Collection of data for anecdotal record.	6-66	Administration of Principals Questions.	6-5-66
Parents	No direct involvement or objective date was obtained from this sample during this phase.		1. Distribution of Title VII B News Notes. 2. Parent's Questionnaire distributed.	1-66,3-66, 7-66 5-1-66

CHAPTER III

RESULTS

A demonstration project is by definition a test -- a trial of a program approach. If it proves successful, the expectation is that (1) it will be established as a permanent program component in the local school systems and (2) its basic strategy will be adopted in other settings elsewhere.

Prior to the presentation of the data, it should be noted that the evaluation of the major objective of the project was cast within the frame of reference of the five questions posed:

1. What were the significant differences in the characteristics between the adoption group of students (completed program text) and the rejection group of students (noncompleted program)?

2. Did more teachers accept than reject programed instruction materials and what were their reactions to the materials introduced?

3. What were the parents' reactions to the use of programed instruction materials?

4. Were the school principals adoptors or rejectors of the innovation?

5. Is a nondirective method of diffusing an innovation (programed instruction) appropriate for dissemination in a rural environment?

The population studied was not randomly selected. Any generalizations made regarding the results of this demonstration project must be parsimonious if outside decision makers wish to go beyond this sample and draw conclusions about superior students in small rural high schools.

The results of measurements and analysis employed in both Phase I and II have been organized to answer the questions that describe the scope and sequence of the project and, thereby, fulfill the major objective. Both total effect and effect of some of the salient component parts are presented.

A. Question One

The first question that was answered was: What were the significant differences in the characteristics between the adoption group of students (completed program) and the rejection group of students (noncompleted program)? The results of the testing and gathering of data on selected variables provided the basis for the description of the characteristics of each of these groups for Phase I and II.

There were 434 students selected to participate in Phase I (1965), of which fourteen (3%) completed the program. In Phase II, 152 (25%) out of 600 completed the program. A summary of the number and percent of boys and girls who completed the program texts is shown in Tables 3 and 4.

TABLE 3.--Summary of programed texts completed by sex in Phase I (1965)

	Male		Female		TOTAL	
	N.	%	N.	%	N.	%
Completed	7	4	7	2	14*	3
Noncompleted	167	94	253	98	420	97
TOTAL	174	98	260	100	434	100

*There was a total of 15 Programed Instruction Texts completed. One student completed two texts.

It may be seen from Tables 3 and 4 that Phase I produced more rejectors (97%) than adoptors (3%). In Phase II there were 25% adopters as compared to 75% rejectors.

TABLE 4.--Summary of programed texts completed by sex in Phase II (1966)

	Male		Female		TOTAL	
	N.	%	N.	%	N.	%
Completed	52	24	100	26	152	25
Noncompleted	164	76	284	74	448	75
TOTAL	216	100	384	100	600	100

The number of programed texts offered as a possible selection in Phase I was two -- Human Behavior and Statistics. Ten students, five girls and five boys, completed the Human Behavior programed text. In addition, two girls and two boys completed the Statistics program. In Phase II a total of six programed texts were offered as a possible selection. Table 5 summarizes the number and percent of girls and boys choosing and completing each program.

TABLE 5.--Summary of the number and percent of boys and girls selecting and completing each of the programs in Phase II

	Male			Female			Total		
	Chosen	Complete		Chosen	Complete		Chosen	Complete	
		N.	%		N.	%		N.	%
Sets	73	16	22	55	14	26	128	30	23
Genetics	65	12	19	105	16	15	170	28	17
Spelling	42	16	38	112	47	42	154	63	41
Social Behavior	17	5	29	64	17	27	81	22	27
Human Behavior	17	3	17	48	6	13	65	9	14
Statistics	2	0	0	0	0	0	2	0	0

There were 20 schools in Phase I and 30 schools in Phase II. The 20 schools had students who participated in both phases. Table 6 summarizes and compares the students who participated in Phase I and II with those students who were only in Phase II.

TABLE 6.--Summary of the number and percent in Phase II completed and noncompleted of programs by sex and by the number of years in the project

	Completed				Noncompleted				TOTAL	
	Male		Female		Male		Female			
	N.	%	N.	%	N.	%	N.	%	N.	%
First Year in Program Phase II only	42	7	83	13	101	17	181	30	407	67
Second Year in Program Phase I and Phase II	10	2	17	3	62	10	104	17	193	32
TOTAL	52	9	100	16	163	27	285	47	600	99*

*The total percent does not equal 100 due to rounding error.

It may be seen from Table 6 that 152 (25%) of the students who participated in Phase II completed the programed text. There were 17 girls and 10 boys who completed and were in Phases I and II as compared to 83 girls and 42 boys who were in Phase II only.

An analysis of variance was performed on the ten variables from Phase I. Table 7 shows a summary of the results of the analysis on the completion and noncompletion groups in Phase I. Grade Placement, California Test of Mental Maturity (Language), California Test of Mental Maturity (Total), Attitude Toward Programed Instruction Inventory and College Entrance Examination Board (Quantitative subtest), were variables that provided a statistical difference between the two groups. The various levels of significance ranged from the .04 level to the .15 level. The two that were most significant were Attitude Toward Programed Instruction Inventory (.04 level) and California Test of Mental Maturity (Language) (.05 level). The remaining three were significant either at the .15 or the .14 level. Both the California Test of Mental Maturity (Total) and College Entrance Examination Board (Quantitative subtest) are not worthy of further consideration. The California Test of Mental Maturity (Total) is reflecting the California Test of Mental Maturity (Language) score differences and the College Entrance Examination Board (Quantitative subtest) has a relatively small number of students (14) completing the program .

The remaining variable, Grade Placement, should be considered further. The mean for the completion group was 10.69 with a standard deviation of .63, while the noncompletion group had a mean of 11.03 with a standard deviation of .82. There was a significant difference between these means at the .14 level and we may conclude with 86% confidence that there was a significant difference between grade placement for the completion

TABLE 7.--Summary of the results of the analysis of variance selected variables in Phase I for completion and noncompletion 1965

Variables	Completion Group			Noncompletion Group			Bartlett's Test	Probability of Chi Sq.	Analysis of Variance Computed "F" Value	F Probability
	N	Mean	S.D.	*N	Mean	S.D.				
1. Grade Placement	13	10.69	.63	421	11.03	.82	1.29	.26	2.17	.14
2. Sex	13	1.54	.52	421	1.60	.49	.08	.78	2.07	.65
3. Mathematics Attitude	12	73.42	10.75	390	74.02	15.21	2.03	.15	.02	.89
4. California Mental Maturity (Language)	13	126.23	8.32	381	120.62	10.06	.73	.39	3.96	.05
5. California Mental Maturity (Non-Language)	13	116.77	5.97	381	117.43	11.34	1.08	.30	.04	.84
6. California Mental Maturity (Total)	13	122.31	5.82	381	119.17	7.51	1.26	.26	2.23	.14
7. Attitude Toward Programed Instruction	11	41.36	7.16	354	36.17	8.18	.31	.58	4.43	.04
8. Quality Point Average	13	3.61	.23	421	3.56	.30	1.34	.25	.29	.59
9. CEEB Verbal	4	587.50	84.76	263	5.37	74.94	.09	.77	1.81	.18
10. CEEB Quantitative	4	621.50	68.96	263	5.68	72.96	.02	.90	2.12	.15

*The analysis of variance was performed with unequal numbers due to incomplete data gathered for both groups.

and noncompletion groups.

The difference between the scores on the California Mental Maturity Language subtest was significant at the .05 level and it may be concluded with 95% confidence that there was a difference between the two groups. This difference may be viewed as both statistically significant as well as practically significant. The conclusion regarding the practical significance was made on the basis of the 5.61 score points difference between means.

The Attitude Toward Programed Instruction Inventory also had a statistical as well as a practical difference. There was a 5.19 score difference between the completion and noncompletion groups and this provides a statistical difference at the .04 level. It may be concluded with a 96% confidence that there was difference between the two groups.

The analysis of data from Phase II for the completion and noncompletion groups revealed that there were three variables that were significantly different. These variables were Grade Placement, Quality Point Average and the Attitude Toward Programed Instruction Inventory. The results of the analysis of variance and the computed means and standard deviation for the selected variables are shown in Table 8 on page 27.

The completion group's mean Grade Placement was 10.70 as compared to the noncompletion group's 11.06. The completion group's average score on the Attitude Toward Programed Instruction Inventory was 43.43 as compared to 40.29 for the noncompletion group. Both the Grade Placement and Attitude Toward Programed Instruction Inventory were significant at the .01 level. It may be concluded with 99% confidence that there was a difference between the completion and noncompletion groups on these two variables. In addition, there was a significant difference between the two groups' Quality Point Average. This difference was significant at the .03 level and it may be concluded with 97% confidence that there was a difference between the two groups' Quality Point Average.

The results of the Bartlett's Test revealed that three variables were worthy of noting. They were Quality Point Average, California Test of Mental Maturity (Language and Reading Comprehension). In each case the probability of the computed Chi Square was significant at the .03 level or greater. Both the Quality Point Average and the Reading Comprehension Variance was greater for the noncompletion group. The California Language Variance for the completion group was greater than the noncompletion.

The detailed summary of the analysis of variance and Bartlett's Test from which Table 7 and Table 8 were derived

TABLE 8.--Summary of the results of the analysis of variance on selected variables in Phase II for completion and noncompletion groups 1966

Variable	Completion			Noncompletion			Bartlett's Test	Probability of Chi Sq.	ANOVA Computed "F"	F Probability
	N.	Mean	S.D.	N.	Mean	S.D.				
1. Sex	152	1.66	.48	448	1.63	.48	.04	.85	.282	.60
2. Grade	152	10.70	.78	448	11.06	.80	.19	.66	28.45	.01
3. Quality Point Average	152	3.60	.33	448	3.52	.39	6.12	.01	4.84	.03
4. California Mental Maturity (Language)	152	120.10	11.12	448	118.90	9.62	4.97	.03	1.61	.21
5. California Mental Maturity (Non-Language)	152	115.53	12.06	448	114.90	12.97	1.16	.28	.27	.60
6. California Mental Maturity (Total)	152	118.07	8.80	448	117.38	8.86	.01	.94	.69	.41
7. CEEB Verbal	12	522.00	95.81	96	529.28	77.21	.99	.32	.09	.76
8. CEEB Quantitative	12	544.00	72.68	96	563.31	83.48	.34	.56	.14	.71
9. Attitude Toward Programed Instruction Inventory	152	43.43	7.25	448	40.29	7.42	.12	.73	20.61	.01
10. Reading Comprehension	152	195.13	14.23	448	195.29	28.75	85.67	.00	.00	.95
11. Directed Reading	152	179.40	16.11	448	178.11	15.19	.79	.37	.79	.38
12. Poetry	152	187.48	17.03	448	185.61	16.37	.36	.55	1.45	.23
13. Word Mean	152	197.47	13.47	448	196.92	12.16	2.44	.12	.23	.63
14. Sentence Mean	152	192.76	15.14	448	191.68	14.68	.22	.64	.60	.44
15. Paragraph Comprehension	152	194.57	15.65	448	193.32	15.36	.08	.78	.75	.39
16. Use of Index	152	188.88	16.57	448	188.71	15.45	1.12	.29	.01	.91
17. Key Word	152	187.48	12.98	448	188.69	13.20	.06	.80	.97	.33

appear in Appendix B. In addition, a matrix showing the intercorrelations of the variables for which data was gathered in Phases I and II appear in Appendix B.

The results of the single classification analysis of variance provided the necessary information for an additional analysis. The significant variables for Phase II were Grade Placement and the Attitude Toward Programed Instruction Inventory. These two variables were significant in both phases along with the California Language Test in Phase I. The Language scores variance for the second phase also was different even though there was no difference between means.

The California Language scores were divided into high-low groups for both the completion and noncompletion groups. A two-way classification analysis of variance was performed on the data. A summary of the means and standard deviations for the completion high-low and noncompletion high-low groups appear in Table 9.

TABLE 9.--Summary of mean and standard deviations for high-low completion and noncompletion groups on selected variables

Variable	Completion						Noncompletion					
	High Language			Low Language			High Language			Low Language		
	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.	No.	Mean	S.D.
1. Grade	80	10.80	.80	72	10.58	.75	215	11.12	.80	233	11.01	.81
2. Attitude P. I.	80	43.55	7.85	72	43.30	6.57	215	40.54	7.59	233	40.06	7.21

A summary of the analysis of variance for the two-way classification using the Grade Placement as the criterion variable appears in Table 10.

TABLE 10.--Summary of Bartletts Test and analysis of variance for a two-way classification for the completed and noncompleted high-low students using grade as the criterion variable

Source	Sum of Squares	D. F.	Mean Square	F	F Probability
Complete vs. Noncomplete	15.58	1	15.58	24.55	.01
High Language vs. Low Language	2.97	1	2.97	4.68	.03
Interaction	.34	1	.34	.542	.46
Within Cells	378.34	596	.63		
Total	397.23	599			

Bartletts Test .72
Probability of Chi Square W/ 3 D.F. =.87

It may be seen that there were main effects, row (completion vs. noncompletion), and column (high vs. low), between groups. The difference between rows was significant at the .01 level and between columns at the .03 level. There were no interaction effects.

The Attitude Toward Programed Instruction Inventory was used as the criterion variable in a two-way classification analysis of variance with completion vs. noncompletion and high vs. low language scores as the two classifications.

TABLE 11.--Summary of Bartlettś Test and analysis for the completed and noncompleted high-low students using attitude toward program instruction as the criterion variable

Source	Sum of Squares	D. F.	Mean Square	F	F Probability
Complete vs. Noncomplete	1107.72	1	1107.72	20.30	.01
High Language vs. Low Language	14.83	1	14.83	.27	.60
Interaction	1.56	1	1.56	.03	.86
Within Cells	32527.59	596	54.58		
Total	33651.70	599			

Bartlett's Test 2.82
Probability of Chi Square W/ 3 D.F. = 42

The results of the analysis of variance are summarized in Table 11. There was a significant difference at the .01 level between the completion group and noncompletion group. There was no significant difference between high-low scores and there were no interaction effects.

B. Question Two

The second question that was answered was: Did more teachers accept than reject programed instruction materials and what were their reactions to the materials introduced?

There were two nonthreatening exposures to the materials that were provided by the project administrators. One activity involved the voluntary use of programed instruction materials by teachers with selected (average) classes. The other exposure was indirect and required the interest and initiative of the teachers. A variety of program materials were placed in the library for interested individuals. The analysis of teacher response and participation in this phase is detailed along with the students' participation in the answer to question five.

The response of the twenty-one teachers who volunteered and were selected by their principals served as the source of information for which answers to this question were sought. The Semantic Differential Inventory was administered pre and post to the sample of twenty-one teachers. Tables 12 and 13 summarize the results of this analysis on the Semantic Differential Inventory. It may be seen from Table 12 that the average score for each of the three factors: evaluation, potency and activity increase with the administration of the post-test. There were twenty items that were scored on a seven-point scale with seven being positive, four neutral and one negative. The maximum score that any individual could make was 140 and the minimum was twenty.

It should be noted that all of the pre-test average scores suggest that the group was favorably disposed to programed instruction when they entered the project.

It is important to keep these facts in mind as the results are presented and interpreted. Guilford states "that a correlation is always relative to the situation under which it is obtained, and its size does not represent any natural fact." He continues, "Always, the coefficient of correlation is purely relative to the circumstances under which it was obtained and should be interpreted in the light of those circumstances, very rarely, certainly, in any absolute sense."[1]

The average evaluation score on the pre-test was 108.43 which suggests that the teachers entered the demonstration project with a positive view of programed instruction. They were less positive on the potency and activity factors although the average scores indicate a positive attitude.

TABLE 12.--Summary of the computed difference between the pre-post-administering of the Semantic Differential Inventory

Summary Statistic	Evaluation		Potency		Activity	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
Mean	108.43	114.38	106.38	114.05	107.38	115.00
Standard Deviation	24.21	14.11	20.29	13.49	21.53	14.24
Mean Difference	5.95		7.67		7.62	
Computed Value	1.27		*3.26		*8.75	
*Significant at the .01 level.						

The post-test average scores were also positive with an increase on each of the three factors. There was a significant difference on both the potency and activity factors. The average increase on the potency factor was 7.67 and the average increase on the activity factor was 7.62. Both of these average gains were significant at the .01 level and it may be concluded with 99% confidence that there was a significant difference between the pre-

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[1] J.P. Guilford, op.cit. p. 104

and post-measures of attitude toward programed instruction as measured by the activity and potency factors of the Semantic Differential Inventory.

There was no significant difference between the pre-and post-measures on the evaluative factor. There was, however, an average difference of 5.95 between the pre-and post-measure.

Table 13 summarizes the results of intercorrelation between each of the three factors from the pre-and post-testing.

TABLE 13.--Summary of the means - standard deviations and intercorrelations of the teachers' responses to the Semantic Differential Inventory (N=21)

Pre-Test	Intercorrelations						Pre-Test	
	1	2	3	4	5	6	Mean	S.D.
1. Evaluation	-	.80	.89	.50	.30	.14	108.43	24.21
2. Potency	.80	-	.89	.71	.63	.54	106.38	20.29
3. Activity	.89	.89	-	.60	.56	.40	107.38	21.53
Post-Test							Post-Test	
							Mean	S.D.
4. Evaluation	.50	.71	.60	-	.83	.77	114.38	14.11
5. Potency	.30	.63	.56	.83	-	.94	114.05	13.49
6. Activity	.14	.54	.40	.77	.94	-	115.00	14.24

The correlations ranged from .14 to .94. The correlations indicate that there was stability in the measurement through time. All correlations of .43 or greater with 19 degrees of freedom were significant at the .05 level. The low correlations (.14) between the pre-test evaluation and post-test activity factors may be viewed as an index as to the amount of change regarding how active the teachers felt prior to the project. The correlation of .77 between the post-test activity score and the post-test evaluation score coupled with the .50 correlation between the pre-and post-score on the evaluation scale suggests that there was a tendency to be favorably disposed to the programed instruction materials. This is not to suggest that when the project began that they were not positive about programed instruction.

The coefficient of determination for the intercorrelations between evaluation, activity and potency were 69% (evaluation and potency), 59% (evaluation-activity) and 88% (activity-potency). It may be concluded that the percent of variance explained by the intercorrelation on the post-test provided a minimum amount of unexplained variance and a maximum amount of variance explained. As was noted the attitude was positive and the high correlations between the factors suggest that the initial attitude measures on the pre-test evaluation factor generalized to the activity and potency factors.

The response to the teacher's questionnaire which is summarized in Appendix I provided additional insight to the teachers attitudes.

C. Question Three

The third question to be answered in support of the major objective of the project was: What were the parents' reactions to the use of programed instruction materials? The parents were surveyed by mail regarding their attitude about programed instruction. There was a total of 600 questionnaires mailed of which 20 were returned undelivered and 358 (62%) were returned completed. There were 36 completed and signed questionnaires and 322 unsigned.

The questionnaire was a self-administrating instrument (see Appendix K), and consisted of eight questions. The first question required the parents to indicate where they had first heard about programed instruction. There were three choices: (1) heard about programed instruction before the project, (2) as a result of the project and (3) other. Seventy-one percent reported that they heard about programed instruction as a result of the project, 23% before the project and 6% reported other.

A summary of how these three groups answered each question appears in Table 14 on page 34.

It may be seen from Table 14 that only question eight, "Would you like to take a programed learned course yourself in some subject in which you are interested?" provided a significant difference between the three groups. The average response of the parents who heard about programed instruction as a result of the project tended to be positive. The mean for this group was 1.42 while the average for the other two groups was 1.13 and 1.11 which tended to be more negative.

There were three questions (3, 7, and 8) that were significantly different when the data was analyzed using Bartlett's Test. Each of these questions was significant at the .01 level. It may be concluded with 99% confidence that there was a difference in the variance. In each case the greatest variance of scores occurred in the group of parents who heard about programed instruction as a result of the project.

There was only one question (5) that had a different average response for the three groups. Both the parents who had heard about programed instruction as a result or before the project answered "no" to the question: "Do you think that your child can learn as much from a programed text as from a regular class in school?" The "other" group answered "yes" to this question.

TABLE 14.--Summary of means, standard deviations, Bartlett's test, and analysis of variance for the parents who heard about programed instruction before the project, as a result of the project and for those parents who specified other

(N = 358) ** QUESTIONS	Parents who had heard about Programed Instruction before the project			Parents who had heard about Programed Instruction as a result of the project			Parents who specified other .			Bart. Test	Prob. Chi Sq.	Analysis of var. Comp. F	F Prob.
	No.	Mean*	St.Dev.	No.	Mean	St.Dev.	No.	Mean	St.Dev.				
2. Do you think that your child has gained valuable knowledge from the programed learning experience he has been having?	79	1.06	.25	223	1.07	.26	20	1.05	.22	.92	.63	.09	.92
3. Do you like the idea of your child being able to advance at his own speed in this programed learning project?	84	1.02	.15	236	1.07	.25	21	1.05	.22	24.63	.00	.42	.65
4. Would your child have advanced more rapidly with more teacher advice and direction?	68	1.23	.43	209	1.24	.43	18	1.17	.38	.38	.82	.39	.68
5. Do you think that your child can learn as much from a programed text as from a regular class in school?	80	1.51	.50	221	1.59	.49	21	1.43	.51	.06	.97	1.19	.30
6. Has the time spent on this programed learning course interfered with your child's regular activities--school or personal?	85	1.85	.36	243	1.85	.36	21	1.91	.30	1.08	.58	.40	.67
7. Do you think that programs in additional subjects under programed learning would be of benefit to your child?	82	1.05	.22	217	1.10	.30	21	1.05	.22	12.12	.00	.48	.61
8. Would you like to take a programed learning course yourself in some subject in which you are interested?	70	1.13	.34	205	1.42	.49	18	1.11	.32	16.18	.00	5.87	.01

* .5 to 1.49 has been interpreted as yes. 1.50 or greater has been interpreted as no.

**Each analysis of variance was performed with a different N. Only the yes-no responses for each question were analyzed. The no-opinion responses were deleted prior to the analysis.

The parents' questionnaire may be summarized in the following manner, that on the average: the parents thought that their children gained valuable knowledge from the programed learning experience; they like the idea of their children advancing at their own speed; they believed that their children would advance more rapidly with more teacher direction and help; and they felt that their children could not learn as much from the programed text as a regular classroom.

In addition, the parents on the average felt that the programed instruction project did not interfere with their children's regular activities. They felt that programed materials in additional subjects would be a benefit to their children, however, they were not interested in taking a programed course themselves.

An analysis of the response of parents who signed their names was accomplished and compared with the results of the response of parents who did not sign their names. There was no significant difference between the two groups. A summary of the responses and the statistical analysis appears in Appendix L.

D. Question Four

The fourth question to be answered was: Were the school principals adoptors or rejectors of the innovation? Thirty principals from the participating schools were surveyed with a one page questionnaire regarding the use of programed instruction. Twenty-eight of the thirty principals returned the questionnaire. Eighty percent (24) of the thirty principals indicated that they would be interested in having their school participate in the project next year.

Generally the high school principals perceived the high ability student as most appropriate to participate in a programed instruction project. Sixty-one percent of the principals felt that the high ability type students should be permitted to participate. In addition, the principals felt that grades 10, 11 and 12 were the most appropriate for the use of programed instruction. Ninty-six percent reported grade 10, ninty-three percent grade 11, and seventy-nine percent grade 12.

The most appropriate use in course offerings as viewed by the majority of the principals was a wide range of enrichment. Eighty-six percent advocated enrichment, 14% (4) indicated elective only, and 7% (2) felt that it was appropriate for required courses.

Independent study with teacher direction on a scheduled interval was viewed as the most appropriate by 68% (19) of the principals, while eleven percent of the principals reported that programed instruction was most appropriate when used in individual study without teacher direction. Thirty-two percent of the principals felt that programed instruction should be used with teacher direction and determination.

Seventy-five percent of the principals felt that it was most appropriate for students to have general supervision with special teachers available for consultation.

The majority of principals (93%) favored the use of programed instruction for credit. Fifty percent (14) favored the use in selected subjects only and forty-three percent (12) favored any subject area if appropriate materials were available.

The general conclusion regarding the question concerning the principals as adoptors or rejectors was not clearly answered. It did appear that most of the principals were adoptors with acceptance being delimited to the use made of programed instruction as conceived by the project administrators.

A summary of the number and percent of the principals' responses to the questionnaire appears in Appendix O.

E. Question Five

The fifth question that was answered in support of the major objective was: Is a nondirective method of diffusing an innovation (programed instruction) appropriate for dissemination in a rural environment? Three measures provide an estimate of how effective the nondirective method of dissemination was in this environment: Anecdotal Records, the Programed Learning Material Library Information Sheet and the student's response to an open-ended questionnaire. The Anecdotal Records provide information about the students', teachers', and administrators' attitude. This data was gathered by the research assistants when they visited the schools. The Programed Learning Material Library Information Sheet provided information regarding the use of programed text, purpose for borrowing text, extent purpose was fulfilled and length of time text was borrowed. The students in completing the questionnaire responded to questions that related to the value, advantages and disadvantages of programed instruction.

The Programed Learning Material Library Information Sheet was completed by 231 users of the programed materials of which there were one hundred and forty-five students (63%), eighty-four teachers (36%) and two principals (approximately .9%). Table 15 summarizes the response of the students and teachers to the recommended use of the programed texts. It should be noted that there was a variety of programed text selections offered for distribution through the library facilities. The responses reported on the Programed Learning Material Library Information Sheet have been summarized for all of the programs and have not been analyzed according to the individual programed text.

It may be seen from Table 15 that 56 (67%) of the teachers indicated that the programed materials were appropriate for either classroom use or supplementary materials for study outside the regular classroom. Fifty-eight (40%) students felt that the materials were appropriate for study outside the regular classroom and 83 (57%) recommended use of the materials for classroom use or for supplementary materials.

Of the 145 students 45 (31%) completed the programed text that they obtained from the library. Fifteen (17%) of the eighty-four teachers completed their text. The general purpose for borrowing the text as reported by 140 (97%) of the students and 65 (77%) of the teachers was for a school assignment. Tables 16 and 17 summarizes the use of text, and general purpose for borrowing the text.

TABLE 15.--Summary of programed learning materials, library information, summary of the recommended use of programed text, specific purpose for borrowing text, and extent to which the purpose was fulfilled

Recommended Use of the Programed Text	Student		Teacher		Total	
	N.	%	N.	%	N.	%
Appropriate for Classroom Use	40	28	25	30	65	28
Appropriate for Supplementary Material	43	29	31	37	74	33
Appropriate for Study Outside Regular Classroom	58	40	20	24	78	34
Other (Not Sure)	4	3	8	9	12	5
TOTAL	145	100	84	100	*229	100

*The total sample that completed the Programed Learning Material Library Information Sheet was 231. Two of the respondents were principals, and were not included in this analysis.

TABLE 16.--Summary of the use of text for students and teachers who completed the Programed Learning Material Library Information Sheet

Use of Text	Student		Teacher		Total	
	N.	%	N.	%	N.	%
Browsed	41	28	49	58	90	40
Partially Completed	59	41	20	24	79	34
Completed	45	31	15	17	60	26
Total	145	100	84	100	229	100

The student questionnaire was completed by 541 (90%) of the 600 students who were selected to participate in the project. The students were asked to record the value of programed instruction advantages and disadvantages. Table 18 summarizes the number and percent of the students responses to perceived value of programed instruction. They were categorized into five areas. These areas were: interesting, enables the individual to proceed at different rates, develops awareness and clear understanding, good for enrichment activities, and none. The most frequently stated value of programed instruction as reported by the students (56%) was: Good for enrichment activities. Sixteen percent indicated that program instruction enables the individual to proceed at different rates, while 14% felt that there was no value (none) of programed instruction.

TABLE 17.--Summary of the general purpose for borrowing text for the students and teachers who completed the Programed Learning Material Library Information Sheet

General Purpose for Borrowing Text	Student		Teacher		Total	
	N.	%	N.	%	N.	%
School Assignment	140	97	65	77	209	90
Classroom Use	5	3	19	23	24	10
TOTAL	145	100	84	100	233	100

The response to the advantages of programed instruction were also categorized into four groups: individualized instruction, TABLE 18.--Summary of the number and percent of the students' (by area) responses to perceived value of programed instruction

Value of Programed Instruction	Area A		Area B		Area C		Total	
	N.	%	N.	%	N.	%	N.	%
01 Interesting	23	12	14	89	12	6	49	9
02 Enables the Individual to Proceed at Different Rates	30	16	22	13	33	18	85	16
03 Develops Awareness and Clear Understanding	2	1	12	7	13	7	27	5
04 Good for Enrichment Activities	119	62	81	50	103	56	303	56
05 None	17	9	34	21	23	13	74	14
TOTAL	191	100	163	100	184	100	538	100

enrichment, usable and clear, other, and none. The great majority (79%) indicated that the advantage of the programed instruction the "individualized instruction" aspect. In addition, 75 (14%) reported that the advantage of programed instruction was "enrichment". The remaining 7% was distributed among the other three categories. A summary of the students response to the advantages of programed instruction appears in Table 19.

TABLE 19.--Summary of students' responses to perceived advantages of programed instruction

Perceived Advantages	Area A		Area B		Area C		Total	
	N.	%	N.	%	N.	%	N.	%
Individualized Instruction	147	77	138	80	140	76	425	79
Enrichment	26	13	15	12	34	18	75	14
Usable and Clear	11	6	6	3	3	2	20	4
Other (Grades Not a Concern, Teacher Not Interfering)	3	2	2	2	2	2	8	1
None	4	2	5	3	4	2	13	2
TOTAL	191	100	166	100	184	100	541	100

The response of the students, by area, to what they considered to be disadvantages of programed instruction appears in Table 20.

TABLE 20.--Summary of students' responses to perceived disadvantages of programed instruction

Perceived Disadvantage	Area A		Area B		Area B		Total	
	N.	%	N.	%	N.	%	N.	%
Not Enough Time	35	23	51	39	56	31	142	30
No Direction or Teacher Help	59	45	41	31	92	49	192	41
Not Interesting	19	10	16	12	13	7	48	10
Other (To Hard, Easy to Forget)	35	19	17	13	10	6	62	13
None	6	3	7	5	13	7	26	6
TOTAL	154	100	132	100	184	100	470	100

There were 192 (41%) students of the 470 that indicated that the lack of direction or help by the teacher was the main disadvantage. Thirty percent reported that they did not have "enough time". A small group of students, 48 (10%), reported that programed instruction was "not interesting".

The anecdotal records maintained by the research assistants on students, teachers and administrators reactions in Phase I appears in Appendixes D, F and M. The diversity of response and opinion regarding programed instruction may be seen by some of the following observations by the research assistants:

> "There were several administrators who wanted to include students of average ability in this type of project. They expressed concern over the amount of time available to the superior students because of his heavy academic load and his involvement in co-curricular activities. They felt that the average students had more time for extra class work."
>
> "There were several requests for permission to include students from grades other than ten, eleven and twelve."
>
> "Members of the project staff honored several requests during the school year to attend inservice meetings at a number of project schools and discuss the project."

The research assistants' records on teacher and counselor who served as liason personnel for the study provided another percept of the project. The following statements taken from the research assistants' anecdotal record reported in the Appendix serves as a sample of the liason personnels reactions.

> "Several liason personnel mentioned that they thought more motivation should be included in the program. This motivation might be something as simple as a luncheon for the participating students."
>
> "It takes many more volumes of programed materials to teach a subject than with an ordinary textbook so this makes it impractical."

In addition to the administrators and liason personnel reactions, anecdotal records on student behavior was maintained. A sample of the students' reaction as reported by the research assistants follows:

> "Students at one school expressed concern at the orientation meeting that they would be given grades for their work. They were releived to hear that no grades were involved."
>
> "One student reported that working on programed materials for 30 minutes 'was enough'."
>
> "One student when asked how she liked programed instruction replied that it was 'fun and different'."
>
> "I get bored doing it (statistics) and it doesn't interest me very much. It's hard to concentrate on the material but you need to concentrate to learn it."
>
> "I like it even though sometimes it is hard to find time to work on it."
>
> "Vocabulary is difficult. Material (Human Behavior) requires a lot of concentration. Blanks and print are small."
>
> "I think it is easier to study this way."
>
> "I do not prefer this course to regular classroom courses because I would rather ask questions."
>
> "Trying to keep up other grades seems only to allow time to work on this over the weekend."
>
> "I really like this method. Sometimes, when I am mad at teachers, I wish all my courses were taught in this manner."

> "When I do try to work on my program during the week I make sure I've finished my regular homework because I get so involved in it I tend to forget my regular studies."

The anecdotal record maintained on the students by the research assistants along with the students written reactions to programed instruction were analyzed. A representative sample of the students' written responses and the research assistants' anecdotal record appear in Appendix D.

CHAPTER IV

DISCUSSION

The needs of students, parents, teachers and school administrators in the rural-agrarian and rural-industrial area in which the project was conducted have increased with every technological innovation. The cooperative effort of college project personnel and students, teachers and parents provided a proper balance for the introduction of program instruction and an objective evaluation of the effects of the project.

Miles[1] points out, however, that two forces may serve to block adequate educational evaluation, "the innovative enthusiasm and messianic zeal often noted in experimental enterprises may come to have a self-justifying strength; systematic evaluation might prove risk-takers wrong and dampen the satisfying ardor of the mutually converted, and the imperatives of organizational survival inevitably enter into the evaluation of any particular innovation."

The basic axioms of the project (Chapter I) coupled with the previous research and formation of a theory of adoption or rejection by Eichholz and Rogers provided an objective frame of reference for the "agents of change" (project staff) and the target population (subgroups) to respond naturally.

The five stages of adoption or rejection suggested by Eichholz and Rogers[2] are parallel,and the forms (ignorance, suspended judgment, situational, personal and experimental) of adoption-rejection explain the time differential in the process. This theory was constructed,based on the results of a study with a group of elementary teachers. The research drawing from studies in rural sociology employed the individual farmer as compared to the individual teacher as the unit of analysis. The use of the individual teacher as the unit of analysis instead of the school system maximizes the amount of individual variations in acceptance of the innovation and minimizes the amount of cancellations created by using the school or school system as the unit of analysis.[3]

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[1] Miles, op. cit., p. 659

[2] Eichholz and Rogers, op. cit., P. 311

[3] Eichholz and Rogers, op. cit., p. 316

The subgroups for which data was gathered were analyzed as the unit of analysis. It is important to note that the sample of students, teachers, administrators and parents was not selected randomly (see Chapter II). Each of the questions answered in support of the major objecttive provided the basis for evaluating the effectiveness of the project design.

The answer to the first question concerning the students in the project provided information about student adopters and rejectors. The students who were selected to participate in Phases I and II of the project produced more rejectors than adopters of the innovation when completion of the individually selected text was used as the criterion. Of the students three percent in Phase I and twenty-five percent in Phase II were adopters. For details on unit test completed in Phases I and II see Appendix C. The difference in the completion rate may be attributed to the variety and increased number of program texts in Phase II. There were only two texts offered as possible selections as compared to six in Phase II. It is interesting to note that there was no sex difference in the percent completing the course.

An analysis of the number and percent of the students who participated in both Phase I and Phase II and completed the course was accomplished and compared with the results of the students who only participated in Phase II. It appears that there was a difference (Table 6) between the two groups with the students participating in Phase II only completing more programs.

The significant variables that were identified for the adoption group as a result of the analysis of data collected on the students in Phases I and II were: Grade Placement, California Mental Maturity Language Score, Attitude Toward Programed Instruction Inventory and the students' Quality Point Average. The adopters (completion group), on the average, were in the 10th grade (mean grade for both phases was 10.7) as compared to the rejectors' 11th grade placement (mean 11.03 in Phase I and 11.06 in Phase II). This difference was significant at the .14 level in Phase I and at the .01 level in Phase II. The completion group's California Mental Maturity Language Score was significally different in Phase I (at the .05 level) but not in Phase II (.21 level). The Attitude Toward Programed Instruction Inventory provided the most stable measure employed in both phases. The difference between the adopters and rejectors on this variable was significant at the .04 level in Phase I and at the .01 level in Phase II.

The significance of this finding supports Eichholz and Rogers supposition, that the predisposition of the individual to either adoption or rejection[4] will effect the rate and the final decision regarding the acceptance or rejection of the innovation. This measure was administered

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[4] Eichholz, op. cit., p. 313

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in both phases prior to the selection of the programed materials. The difference in average scores between the completion and noncompletion group was 5.19 in Phase I and 3.14 in Phase II. This difference is great enough to conclude that there is a practical significant as well as a statistical significant difference on this variable. The implication regarding further use of this instrument to measure and identify the predisposition of the students prior to the introduction of program materials may be accomplished successfully with this instrument. A decision regarding whether the student should proceed or be given additional orientation to the purpose and scope of the programed materials then could be made and an increase in the number of positive experiences with programed instruction may be achieved.

A factor analysis was accomplished on the response of a random sample of 89 students to identify the factor structure of the instrument. The results of the analysis along with the intercorrelation matrix of items appear in the appendix. The results of the factor analysis describe the inventory structure. It appears that the inventory does have factorial validity and may be used by teachers, counselors and administrators prior to the introduction of this method of instruction.

In summary, the major characteristics that differentiate the adopters from the rejectors in the student sample were: that the adopters were, on the average, in grade ten and they were more positive regarding programed instruction as measured by the Attitude Toward Programed Instruction Inventory.

The two nonthreatening exposures to the programed instruction materials were designed to maximize participation on the part of teachers with a minimum amount of pressure by project administrators. The twenty-one teachers that volunteered and were selected by their respective school administrators were given a variety of materials to use with their classes (students with average ability).

It may be seen from Tables 12 and 13 that the teachers were positive about programed instruction prior to the introduction of the programed materials. They did become more positive on both the activity and potency factor after their participation in the project. In addition, there was an increase on the evaluative scale, although it was not significant.

Prior to the initiation of the project the question was asked of the teachers: "On the basis of your present knowledge about programed instruction, how would you rate your present reaction to it?" Their response supported the results of the Semantic Differential Inventory pre- and post-testing with fourteen (67%) of the teachers indicating they were "Enthusiastic" or "Favorable," while six were "Neutral" and one was strongly opposed.

Five of the twenty-one teachers used programed instruction prior to the project, and fifteen of the twenty-one teachers planned to use the programs twenty to forty-five minutes a day. Eighteen (86%) teachers reported that they were interested in obtaining information concerning ways of utilization.

Eleven (52%) planned to use programed materials along with the regular classroom instruction. Seven (33%) felt the advantage in using programed instruction was the individualized instruction features. In addition, seven of the teachers indicated it would be appropriate for skill development. The disadvantages of programed instruction as reported by the teachers were: none, ten teachers (47%); students bored and not interested, six teachers (29%); and not clear, two teachers (9%).

The majority of the teachers, sixteen (76%), anticipated using programed learning materials as a part of their regular instruction. A few teachers reported that they anticipated using programed learning materials as a supplement, enrichment and a combination of ways. It is interesting to note that none of the teachers reported that they anticipated using the materials as review, and only one indicated that it would be used for remedial work.

Teachers anticipated their role when using the materials as active assistants to the students. They reject the role as proctor only and were not enthused about being available for questions only.

It may be concluded that the teachers selected to participate in the project were adopters of the innovation.

The answer to question three provided information on the amount of acceptance or rejection that was observed in the parent subsample. Although 358 parents completed and returned the questionnaire, the total number returned was only 62%. The parents were not required to sign their names, and there was no possibility for a follow-up to obtain incompleted questionnaires.

The parents that did respond, demonstrated that the activities in the rural-/industrial-agrarian schools are a major source of information and knowledge for the adult community. This premise was supported by responses of the parents: seventy-one percent of the parents heard about programed instruction as a result of the project. The Title VII-B News Notes which were published three times in Phase II served the parents as the vehicle of communication regarding programed instruction. The results of the responses of the parents suggest that this type of publication may serve as an excellent method to develop understanding and knowledge about innovations.

There were thirty-six parents who signed the questionnaire. An analysis of how they compared with the parents who did not sign was accomplished. There was no significant difference between the two groups. There was a significant difference between the two groups in the amount of variance observed on question eight, "Would you like to take a programed learning course yourself in some subject in which you are interested?" (Appendix L, Table L-7 summarizes the results) This difference was significant at the .01 level.

The general attitude that was reflected to the eight questions asked on the questionnaire by the parents was positive. This finding has practical significance when the fact is considered 71% of the parents heard about programed instruction as a result of the project. The method (News Notes) employed by the project administrator as a means of disseminating information to parents might be considered as a valuable source of information for the parents and a method of obtaining support of the parents in initiating educational change. In summary, the parents' response was positive, and the method of communication (Title VII-B News Notes) established provided an excellent means of diffusioning information about programed instruction.

The twenty-eight of the thirty principals that responded to the questionnaire may generally be considered adopters. Twenty-four (80%) of the principals indicated that they would be interested in participating in a similar project next year. This acceptance of the media was limited to the exposure that was planned. It is meant by this that, although the principals were positive concerning the use of programed instruction, it was limited to ability types that were used in the study (high ability). This reluctance to generalize the effectivenss of programed instruction was demonstrated in their responses to which grades were most appropriate: 96% reported grade 10; 93% reported grade 11; and 79% reported grade 12.

The use of programed instruction was accepted by the principals, however, it was restricted to use as enrichment (86%) and with teacher direction (68%). In addition, they favored the use of programed instruction for credit (93%), in selected subjects only (50%), while 43% favored any subject area if appropriate materials were available.

The principals may be generally regarded as adopters of the innovation. There was very little divergent thinking, however, on their part as a group regarding the use of programed instruction.

The general cautious response with a minimum amount of deviation from suggested procedure points out the necessity of a more structured inservice program for educational leaders in the region prior to the introduction of additional innovations.

The fifth question that was answered provided information regarding how effective a nondirective method of diffusing an innovation was in a rural environment. As it was stated previously, there were 231 students, teachers and administrators (2) that completed the Programing Materials Information Sheet.

The majority of the teachers (67%) felt that programed materials were appropriate for either classroom use or supplementary materials for study outside the regular classroom. Forty percent of the students felt that the materials were suited for study outside the regular classroom, while 57% advocated the use of programed materials as a supplement to the classroom.

It is interesting to note that 45 students (31%) completed the programed text that they had selected from the library. This percentage (31) exceeded the 25% that were included in the student sample.

The student questionnaire was completed by 541 students (90%) who were selected to participate in the project. There were 74 students (14%) who felt that programed instruction had no value at all. The remaining 86% indicated that the value of programed instruction was: interesting, enables the individual to proceed at different rates, develops awareness and clear understanding, and is good for enrichment activities.

The advantage of programed instruction as perceived by the students (79%) was the individualized instruction aspect while the disadvantage was the lack of direction or help by the teachers. These findings have some definite practical significance regarding the use of programed instruction. The fact that the students verbalized these advantages and disadvantages on an open-ended questionnaire with a high rate of communality of perception warrants consideration in the development of future projects. The reported behaviors in the anecdotal record of the students and teachers by the research assistants support this idea.

The teachers working in the project reported that there was a need for more motivation of the students. Students were reported as feeling confined and not free to ask questions and discuss various aspects of the material.

The comments of the students were both positive and negative regarding programed instruction. One student summarized the feelings of many when he stated, "Individual study of this type outranks by far regular classroom work when a person has to review when he may not need to, and may need to when the class doesn't."

It has long been the goal of educators to develop a method that provides an opportunity for individual students to progress at their own rate. The students in the project did feel that to some degree this method helped in the achievement of this goal.

In summary, the majority of teachers (67%) felt that programed materials were appropriate for either classroom use or supplementary materials for study outside the regular classroom. Thirty-one percent of the students completed the programed texts that they selected which were placed in the library. The percentage completed (31) exceeded the 25% which were included in the student sample.

The advantage of programed instruction, as preceived by the students (79%) selected to participate, was the individualized instruction aspect, while the disadvantage was the lack of direction or help by the teachers.

It may be concluded that the advantages were sufficient to answer in the affirmative to the question: Is a nondirective method of diffusing an innovation (programed instruction) appropriate for dissemination in a rural environment?

CHAPTER V

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

A. Conclusions

The population studied was not randomly selected. Any generalizations made regarding the results of this demonstration project must be parsimonious if outside decision-makers wish to go beyond this sample and draw conclusions about superior students in small rural high schools.

The students that were selected to participate in Phases I and II of the project produced more rejectors than adopters of the innovation when the completion of the individually selected text was used as the criterion. The significant student characteristics that were identified for the adoption group were: Grade Placement, California Mental Maturity Language Score and Attitude Toward Programed Instruction Inventory.

The Attitude Toward Programed Instruction Inventory provided the most stable measure employed in both Phases. The major characteristics that differentiated the adopters from the rejectors in the student sample were: the adopters were, on the average, in grade ten and they were more positive regarding programed instruction as measured by the Attitude Toward Programed Instruction Inventory.

The twenty-one teachers who volunteered and were selected by their principals were favorably disposed to programed instruction prior to the project. The data gathered with the Semantic Differential Inventory shows that there was a significant difference between the pre- and post-measures. The majority of teachers anticipated using programed instruction as a part of their regular instruction and were either enthusiastic or favorable toward the use of programed instruction.

The coefficient of determination for the intercorrelations between evaluation, activity and potency were: 69% (evaluation-potency); 59% (evaluation-activity) and 88% (activity-potency). It may be concluded that the percent of variance explained by the intercorrelations on the pre- and post-tests provided a minimum amount of unexplained variance and a maximum amount of explained variance.

The parents that responded to the questionnaire demonstrated that the activities in rural-agrarian and industrial-agrarian schools are a major source of information and knowledge for the adult community. This premise was supported by response of the parents: seventy-one percent of the parents heard about programed instruction as a result of the project. The Title VII-B News Notes which were published three times in Phase II served the parents as the vehicle of communication regarding programed instruction. The results of the responses of the parents suggest that this type of publication may serve as an excellent method to develop understanding and knowledge about innovations.

The twenty-eight principals that responded to the questionnaire may be considered adopters. However, there was very little divergent thinking by the principals regarding the use of programed instruction, and the use was restricted to the basic design of the project. The general cautious response with a minimum amount of deviation from suggested procedure points out the necessity of a more structured inservice program for educational leaders in the region prior to the introduction of additional innovations.

The majority of the teachers selecting materials from the library reported that programed materials were appropriate for either classroom use or supplementary materials for study outside the regular classroom. Thirty-one percent of the students completed the programed texts they selected, which were placed in the library. The percent of students who completed the texts exceeded the twenty-five percent of the students that were selected to participate by school administrators and project staff.

The advantage of programed instruction, as perceived by the students (79%) selected to participate, was the individualized instruction aspect, while the disadvantage was the lack of direction or help by the teachers.

It was concluded that a nondirective method of diffusing an innovation (programed instruction) was appropriate for dissemination in a rural environment.

B. Implications

The implications from the results of the project supported Eichholz and Rogers' supposition, that the predisposition of the individual to either adoption or rejection will effect the rate and the final decision regarding the acceptance or rejection of the innovation.

The results of the administering of the Attitude Toward Programed Instruction Inventory and the Semantic Differential Scale indicate that a pre-measure should be employed to determine the disposition of the target population. The results of these measures could then be used in the decision-making process for the development of a strategy to provide experiences which would lead to greater adoption of the innovation.

C. Recommendations

The experiences of the project staff and the results of the analysis of the data gathered in the demonstration project served as the basis for the following recommendations.

It is recommended that:

1. The nondirective approach to the dissemination of an innovation with the agents of change coming from outside the system in a rural environment should be used.

2. Planned inservice workshops for school administrators in the use of the proposed innovation should be provided before and during the project to help provide maximum utilization of the innovation.

3. Additional demonstration projects in rural communities be sponsored to help give imputus to the development of similar educational programs that have evolved from this project. (See Appendix U). The Center for Educational Research and Regional Curriculum Development of Clarion State College was developed as a result of this project and the staff in this office has become a source of educational leadership for the region.

4. The development and use of news letters similar to the Title VII-B News Notes be employed in all demonstration projects with dissemination as one of its objectives. The Title VII-B News Notes proved to be a significant source of information and the main vehicle of communication in the rural setting in which this study was conducted.

CHAPTER VI

SUMMARY

The development of methods and techniques to expand and enrich the curriculum in rural schools has been a problem area in which educators have been seeking solutions for many years. The needs of students, parents, teachers and school administrators in rural-agrarian and rural-industrial areas have increased with every technological innovation. These areas are not unlike the small underdeveloped countries in the world, that have been left behind in the space age and the second industrial revolution.

The National Defense Education Act provided monies for the improvement and development of the educational situations in these communities. The local educational leadership, aware of the increased availability of instructional materials responded positively to the request of the administrative staffs of Clarion State and Slippery Rock State Colleges request to participate in a cooperative demonstration project.

The project was designed to describe the effects of the cooperative demonstration project on students, their parents, teachers and high school administrators; to help create an awareness to the many new instructional techniques available; and to augment the existing instructional materials in rural and semi-rural high schools in Pennsylvania.

The major objective of the demonstration project was to investigate, record, evaluate, and report the impact of a carefully planned and implemented program, and to introduce and/or expand instruction within selected public high schools.

In order to adequately describe the scope and sequence of the project and fulfill the major objective of the project answers to the following questions were sought:

1. What were the significant differences in the characteristics between the adoption group of students (completed program) and the rejection group of students (noncompleted program)?

2. Did more teachers accept than reject programed instruction materials and what were their reactions to the materials introduced?

3. What were the parents' reactions to the use of programed instruction materials?

4. Were the school principals adoptors or rejectors of the innovation?

5. Is a nondirective method of diffusing an innovation (programed instruction) appropriate for dissemination in a rural environment?

The procedure that was developed to implement the diffusion of the programed instruction materials in the region and thereby fulfill the major objective, was designed to be consistent with the basic axioms described in the rationale; these axioms were:

1. The implementation of an educational innovation must be accomplished in an orderly manner with a maximum amount of participation on the part of the local community, staff members (teachers and school administrators) and students, and a minimum amount of pressure by the agents of change (innovators).

2. The students must be motivated to participate without receiving additional academic credit.

3. The teachers must be exposed to programed instruction materials in a nonthreatening atmosphere.

4. The parents of the students must receive information regarding programed instruction.

5. Finally, the administrator must become aware and accept programed instruction materials as a productive method of enriching the curriculum and providing for the exceptional high school student.

The five subgroups were studied over a two-year period; they were comprised of selected students, teachers, parents, administrators and users of the programed instruction materials placed in the library. All of the subgroups were involved in Phase II of the project. Only the students participated directly in both Phases I and II.

In the first year, 434 students in grades 10 through 12 were chosen from high schools within the region embraced by Butler, Forest, Jefferson and Lawrence Counties.

In the first semester of the first year, the students were given Introductory Descriptive Statistics with instructions to work independently outside of regular class time. Although the project coordinator was available for help, there was to be no compulsion and no reward in the form of school credit. Each student was provided an opportunity to confer with the research assistant from the project staff every two weeks. These conferences were scheduled in advance on a regular basis. If any student required additional help which his liaison teacher could not provide, a special effort was made to schedule a conference with the research assistant between regular visits.

The unit (achievement) examinations which comprised a part of the programed course were spaced according to units of work completed by the individual. Administration of each test was the result of the student's request to his project coordinator, and the test was forwarded to the respective college for scoring. The test was then returned to the student without delay.

In the second semester, the above procedure was repeated with the exception that Human Behavior was substituted for Introductory Descriptive Statistics.

All students participating in Phase I of the project were given a Certificate of Honor if they completed at least one test in either of the two programed texts employed in the project. In Phase II a Certificate of Completion was issued to each student who completed the programed text that he volumtarily selected during the fall.

In the second year, (Phase II), students from high schools in the counties of Armstrong, Beaver, Mercer, and Warren were added to the project. The 600 students chosen the second year were selected using the same criteria employed the first year (Phase I).

The general procedure established during Phase I of the project for working with the students and schools in the project was continued in Phase II.

The types of programed instruction materials increased from two to six: Sets, Relations and Functions; Introduction to Genetics; Spelling Improvement; Social Behavior; Human Behavior and Introductory Descriptive Statistics.

The involvement of teachers in Phase I of the project was primarily indirect. There were no planned activities and any information regarding the project to all the teachers in the participating schools was obtained vicariously.

In Phase II a more direct involvement of teachers with programed instruction materials was planned. There were two nonthreatening exposures to the material which were provided by the project administrator. The first involved the voluntary use of programed instruction materials in selected classes.

The total sample selected for this exposure consisted of twenty-one teachers. These teachers were identified by their school principals. Their participation in the project and the use of programed instruction with average students was voluntary.

Another program of diffusion of programed instruction material that was replayed by the project administrator, was to place a variety of programed materials in the school library. This expanded exposure of the materials provided information about how these materials were being used and how effective they were viewed by teachers. In addition to the teachers, students, parents, and administrators has an opportunity to review and try out thesa materials.

The parents of the students involved in the project received information in three ways about programed instruction materials: by discussion with their children, by reviewing the programed instruction materials in the school library, and through the project organ, Title VII-B News Notes.

During Phase I the primary source of information for the parents was their children. Phase II provided the two additional methods: library use and the News Notes. There were three copies of the Title VII-B News Notes published: January 1966, March, 1966 and July 1966. These publications described information about the project and programed instruction material.

The activities and involvement of the administrative personnel in each school was limited. There were no scheduled activities planned for the school officials in either Phase. The research assistants were the prime agents of change in the environment to the degree they provided a positive affection. The school administrators were not directly observed or measured. The major question asked them was whether they wanted to continue use of programed instruction materials in their schools.

The population studied was not randomly selected. Any generalizations made regarding the results of this demonstration project must be parsimonious if outside decision makers wish to go beyond this sample and draw conclusions about superior students in small rural high schools.

The students that were selected to participate in Phases I and II of the project produced more rejectors than adoptors of the innovation when the completion of the individually selected text was used as the criterion. The significant student characteristics that were identified for the adoption group were: Grade Placement, California Mental Maturity Language Score and Attitude Toward Programed Instruction Inventory.

The attitude toward Programed Instruction Inventory provided the most stable measure employed in both phases. The major characteristics that differentiated the adoptors from the rejectors in the student sample were: the adoptors were, on the average, in grade ten and they were more positive regarding programed instruction as measured by the Attitude Toward Programed Insturuction Inventory.

The twenty-one teachers who volunteered and were selected by their principals were favorably disposed to programed instruction prior to the project. The data gathered with the Semantic Differential Inventory shows that there was a significant difference between the pre- and post-measures. The majority of teachers anticipated using programed instruction as a part of their regular instruction and were either enthusiastic or favorable toward the use of programed instruction.

The coefficient of determination for the intercorrelations among evaluation, activity and potency factors were: 69% (evaluation-potency); 59% (evaluation-activity) and 88% (activity-potency). It may be concluded that the percent of variance explained by the intercorrelations on the pre- and post-tests provided a minimum amount of unexplained variance and a maximum amount of explained variance.

The parents (62%) that responded to the questionnaire demonstrated that the activities in rural and/or industrial-agrarian schools are a major source of information and knowledge for the adult community. This premise was supported by the response of the parents; seventy-one percent of the parents heard about programed instruction as a result of the project. The Title VII-B News Notes which was published three times in Phase II served the parents as the vehicle of communication regarding programed instruction. The results of the response of the parents suggest that this type of publication may serve as an excellent method to develop understanding and knowledge about innovations.

The twenty-eight principals that responded to the questionnaire may be considered adopters. There was, however, very little divergent thinking by the principals regarding the use of programed instruction and use was restricted to the basic design of the project. The general cautious response with a minimum amount of deviation from suggested procedure points out the necessity of a more structured inservice program for educational leaders in the region prior to the introduction of additional innovations.

The majority of the teachers selecting materials from the library reported that programed materials were appropriated for either classroom use or supplementary materials for study outside the regular classroom. Thirty-one percent of the students completed the programed texts that they selected, which were placed in the library. The percent of students who completed the texts exceeded the twenty-five percent of the students that completed and were selected to participate by the school administrators and project staff.

The advantage of programed instruction as perceived by the students (79%) selected to participate was the individualized instruction aspect while the disadvantage was the lack of direction or help by the teachers.

It was concluded that a nondirective method of diffusing an innovation (programed instruction) was appropriate for dissemination in a rural environment.

The implications from the results of the project supported other research in this area and the supposition, that the predisposition of the individual to either adoption or rejection will effect the rate and final decision regarding the acceptance or rejection of the innovation.

The results of the administration of the Attitude Toward Programed Instruction Inventory and the Semantic Differential Scale indicate that a premeasure should be employed to determine the disposition of the target population. The results of these measures could then be used in the decision making process for the development of a strategy to provide experiences which would lead to greater adoption of the innovations.

The nondirective approach, to the dissemination of an innovation with agents of change coming from outside the system in a rural-agrarian and rural-industrual region was successful in creating an awareness. The need for planned inservice workshops for school administrators in use of the innovation does appear to be necessary to provide maximum utilization of the innovation. As a direct result of the Title VII-B demonstration project the Office of Educational Research and Area Curriculum Development of Clarion State College became a source of educational leadership in Western Pennsylvania. The development and use of Title VII-B News Notes proved to be an important contribution to the project and a major source of information to the parents. It is recommended that all demonstration projects, with dissemination as an objective, develop similar vehicles of communication with the target population.

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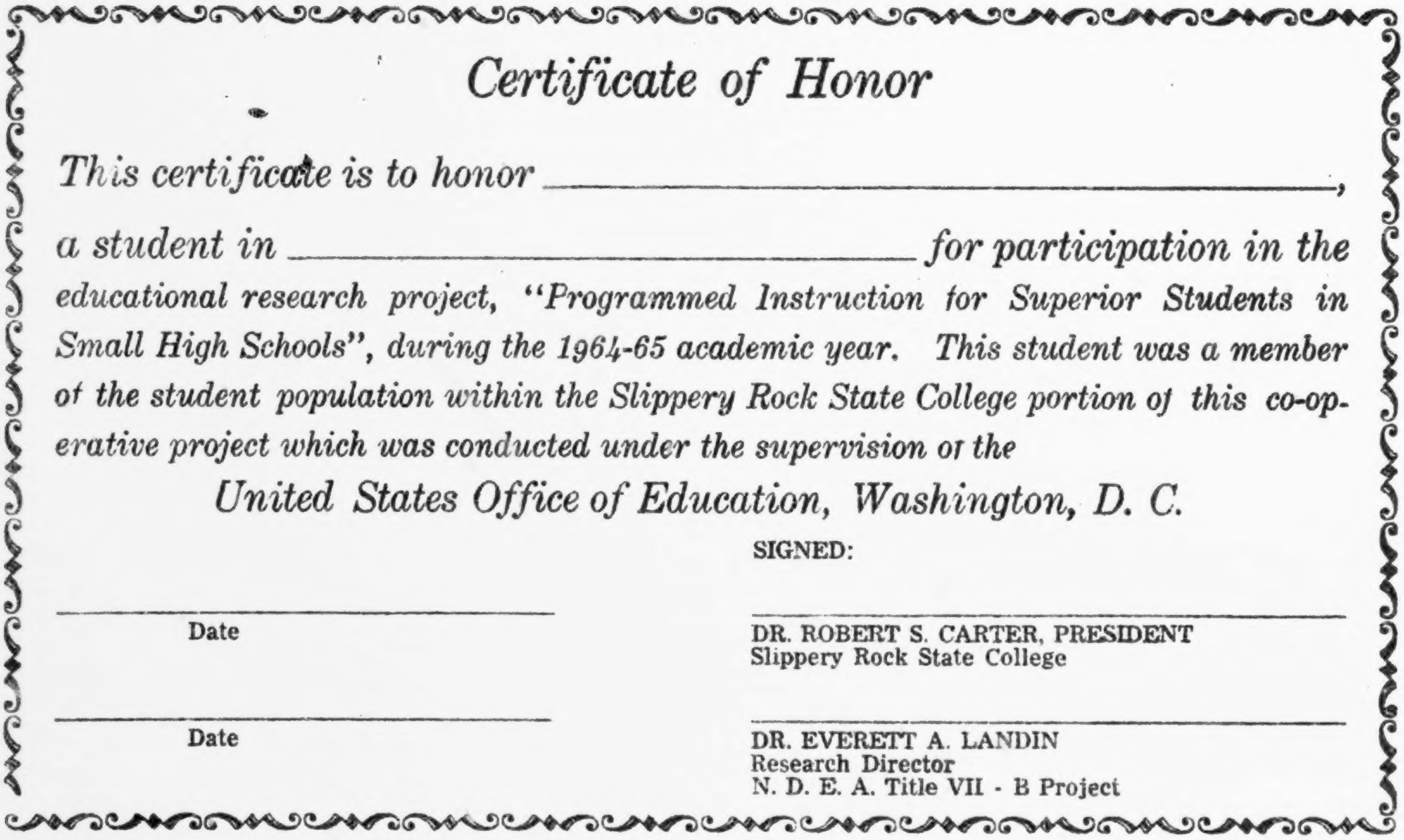
APPENDIX A



Certificate of Honor

This certificate is to honor ______________________________,

a student in ________________________ for participation in the educational research project, "Programmed Instruction for Superior Students in Small High Schools", during the 1964-65 academic year. This student was a member of the student population within the Slippery Rock State College portion of this co-operative project which was conducted under the supervision of the

United States Office of Education, Washington, D. C.

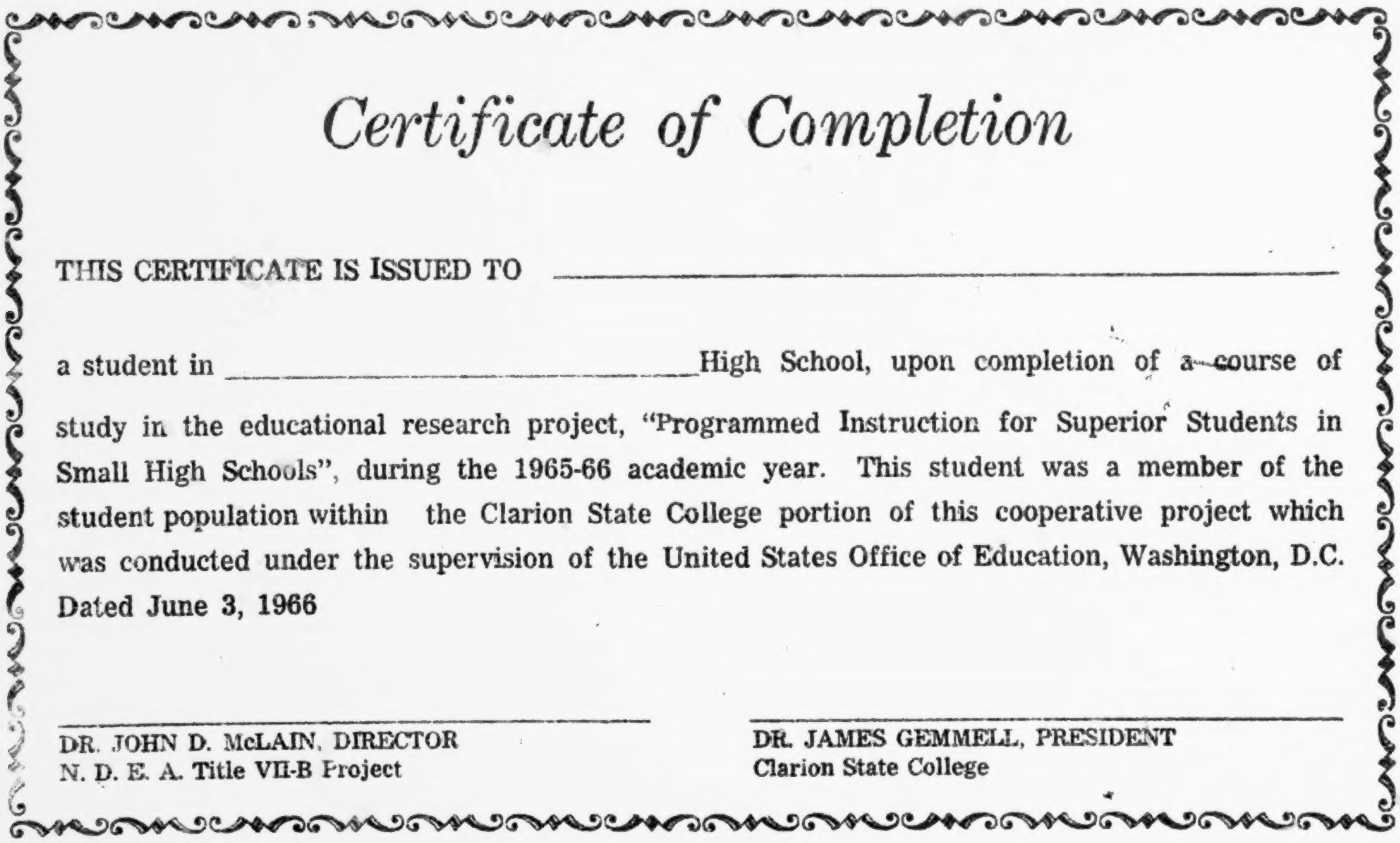
SIGNED:

____
Date

____
DR. ROBERT S. CARTER, PRESIDENT
Slippery Rock State College

____
Date

____
DR. EVERETT A. LANDIN
Research Director
N. D. E. A. Title VII - B Project



Certificate of Completion

THIS CERTIFICATE IS ISSUED TO ______________________________

a student in ________________________ High School, upon completion of a course of study in the educational research project, "Programmed Instruction for Superior Students in Small High Schools", during the 1965-66 academic year. This student was a member of the student population within the Clarion State College portion of this cooperative project which was conducted under the supervision of the United States Office of Education, Washington, D.C. Dated June 3, 1966

____
DR. JOHN D. McLAIN, DIRECTOR
N. D. E. A. Title VII-B Project

____
DR. JAMES GEMMELL, PRESIDENT
Clarion State College

APPENDIX B

SUMMARY OF ANALYSIS OF VARIANCE FOR SELECTED VARIABLES IN PHASES I AND II, INTERCORRELATION MATRIX FOR SELECTED VARIABLES IN PHASE II AND INTERCORRELATION MATRIX OF ITEMS AND FACTOR ANALYSIS OF ATTITUDE TOWARD PROGRAMED INSTRUCTION INVENTORY

TABLE B-1.--Summary of analysis of variance and Bartlett's Test on the Grade Placement for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	1.43	1	1.43	2.17	.14
Within Cells	284.50	432	.66		
TOTAL	285.93	433			
Bartlett's Test = 1.27 Probability of Chi Square with 1 DF = .26					

TABLE B-2.--Summary of analysis of variance and Bartlett's Test on the sex of the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	.05	1	.05	.212	.05
Within Cells	104.02	432	.24		
TOTAL	104.07	433			
Bartlett's Test = .08 Probability of Chi Square with 1 DF = .78					

TABLE B-3.--Summary of analysis of variance and Bartlett's Test on the Mathematics Attitude for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	4.21	1	4.21	.02	.89
Within Cells	91282.02	400	228.21		
TOTAL	91286.23	401			
Bartlett's Test = 2.03 Probability of Chi Square with 1 DF = .15					

TABLE B-4.--Summary of analysis of variance and Bartlett's Test on the California Mental Maturity (Language) Test for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	396.22	1	396.22	3.96	.05
Within Cells	39526.28	392	100.14		
TOTAL	39922.50	393			
Bartlett's Test = .73 Probability of Chi Square with 1 DF = .39					

TABLE B-5.--Summary of analysis of variance and Bartlett's Test on the California Mental Maturity (Non-Language) Test for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	5.41	1	5.41	.04	.84
Within Cells	49859.39	392	127.19		
TOTAL	49864.80	393			
Bartlett's Test = 1.08 Probability of Chi Square with 1 DF = .30					

TABLE B-6.--Summary of analysis of variance and Bartlett's Test on the California Mental Maturity (Total Score) Test for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	124.18	1	.18	2.22	.14
Within Cells	21835.36	392	124.18		
TOTAL	21959.54	393			
Bartlett's Test = 1.26 Probability of Chi Square with 1 DF = .26					

TABLE B-7.--Summary of analysis of variance and Bartlett's Test on the Attitude Toward Program Instruction Inventory for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	287.59	1	287.59	4.33	.04
Within Cells	24113.07	363	66.43		
TOTAL	24400.66	364			

Bartlett's Test = .31 Probability of Chi Square with 1 DF = .58

TABLE B-8.--Summary of analysis of variance and Bartlett's Test on the Quality Point Average for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	264.82	1	264.82	.29	.59
Within Cells	388554.10	432	899.43		
TOTAL	388818.92	433			

Bartlett's Test = 1.34 Probability of Chi Square with 1 DF = .25

TABLE B-9.--Summary of analysis of variance and Bartlett's Test on the College Entrance Education Board Verb Test for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	10169.73	1	10169.73	1.81	.18
Within Cells	1493006.70	265	5633.99		
TOTAL	1503176.43	266			

Bartlett's Test = .09 Probability of Chi Square with 1 DF = .77

TABLE B-10.--Summary of the analysis of variance and Bartlett's Test on the College Entrance Education Board Quantitative Test for the students who completed and did not complete the program instruction text in Phase I (1965)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	11290.05	1	11290.05	2.12	.15
Within Cells	1408960.90	265	5316.83		
TOTAL	1420250.95	266			

Bartlett's Test = .02 Probability of Chi Square with 1 DF = .90

TABLE B-11.--Summary of analysis of variance and Bartlett's Test on the Sex of the Students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	.07	1	.07	.28	.60
Within Cells	138.43	598	.23		
TOTAL	138.50	599			
Bartlett's Test = .04 Probability of Chi Square with 1 DF = .85					

TABLE B-12.--Summary of analysis of variance and Bartlett's Test on the Grade Placement of the students who completed and did not complete the program instruction text Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	14.96	1	14.96	23.45	.00
Within Cells	381.32	598	.64		
TOTAL	396.28	599			
Bartlett's Test = .19 Probability of Chi Square with 1 DF = .66					

TABLE B-13.--Summary of analysis of variance and Bartlett's Test on the Quality Point Average of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	6904.93	1	6904.93	4.84	.03
Within Cells	853638.52	598	1427.49		
TOTAL	860543.45	599			
Bartlett's Test = 6.12 Probability of Chi Square with 1 DF = .014					

TABLE B-14.--Summary of analysis of variance and Bartlett's Test on the California (Language) Test of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	161.16	1	161.16	1.6	.21
Within Cells	60035.14	598			
TOTAL	60196.30	599			
Bartlett's Test = 4.97 Probability of Chi Square with 1 DF = .03					

TABLE B-15.--Summary of analysis of variance and Bartlett's Test on the California (Non-Language) Test for the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	44.03	1	44.04	.27	.60
Within Cells	97122.75	598	162.41		
TOTAL	97166.78	599			

Bartlett's Test = 1.16 Probability of Chi Square with 1 DF = .28

TABLE B-16.--Summary of analysis of variance and Bartlett's Test on the California (Total) Test of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	54.02	1	54.02	.69	.41
Within Cells	46775.97	598	78.22		
TOTAL	46829.99	599			

Bartlett's Test = .01 Probability of Chi Square with 1 DF = .94

TABLE B-17.--Summary of analysis of variance and Bartlett's Test on the College Entrance Education Board Verb Test of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	565.97	1	565.97	.09	.76
Within Cells	667273.38	106	6295.03		
TOTAL	667839.35	107			
Bartlett's Test = .99 Probability of Chi Square with 1 DF = .32					

TABLE B-18.--Summary of analysis of variance and Bartlett's Test on the College Entrance Education Board Quantitative Test of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	925.65	1	925.65	.14	.71
Within Cells	720116.63	106	6793.55		
TOTAL	721042.28	107			
Bartlett's Test = .34 Probability of Chi Square with 1 DF = .56					

TABLE B-19.--Summary of analysis of variance and Bartlett's Test on the Attitude Toward Program Instruction Test of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	1121.86	1	1121.86	20.61	.00
Within Cells	32555.84	598	54.44		
TOTAL	33677.70	599			
Bartlett's Test = .12 Probability of Chi Square with 1 DF = .73					

TABLE B-20.--Summary of analysis of variance and Bartlett's Test on the Iowa Silent Reading Test (Comprehension) of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	2.50	1	2.50	.00	.95
Within Cells	40059.46	598	669.00		
TOTAL	40061.96	599			
Bartlett's Test = 85.67 Probability of Chi Square with 1 DF = .00					

TABLE B-21.--Summary of analysis of variance and Bartlett's Test on the Iowa Silent Reading Test (Directed Reading) of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	187.72	1	187.72	.79	.38
Within Cells	142387.89	598	238.11		
TOTAL	142575.61	599			
Bartlett's Test = .79 Probability of Chi Square with 1 DF = .37					

TABLE B-22.--Summary of analysis of variance and Bartlett's Test on the Iowa Silent Reading Test (Poetry Comprehension) of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	397.91	1	397.91	1.45	.23
Within Cells	163561.06	598	273.51		
TOTAL	163958.97	599			
Bartlett's Test = .36 Probability of Chi Square with 1 DF = .55					

TABLE B-23.--Summary of analysis of variance and Bartlett's Test on the Iowa Silent Reading Test (Word Meaning) of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	35.41	1	35.41	.235	.63
Within Cells	93495.96	598	156.35		
TOTAL	93531.37	599			
Bartlett's Test = 2.44 Probability of Chi Square with 1 DF = .1185					

TABLE B-24.--Summary of analysis of variance and Bartlett's Test on the Iowa Silent Reading Test (Sentence Meaning) of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	131.88	1	131.88	.60	.44
Within Cells	130960.53	598	219.00		
TOTAL	131092.41	599			
Bartlett's Test = .22 Probability of Chi Square with 1 DF = .64					

TABLE B-25.--Summary of analysis of variance and Bartlett's Test on the Iowa Silent Reading Test (Paragraph Comprehension) of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	177.50	1	177.50	.75	.39
Within Cells	142441.89	598	238.20		
TOTAL	142619.39	599			
Bartlett's Test = .08 Probability of Chi Square with 1 DF = .78					

TABLE B-26.--Summary of analysis of variance and Bartlett's Test on the Iowa Silent Reading Test (Use of Index) of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	3.40	1	3.40	.01	.91
Within Cells	148225.46	598	247.87		
TOTAL	148228.86	599			
Bartlett's Test = 1.125 Probability of Chi Square with 1 DF = .29					

TABLE B-27.--Summary of analysis of variance and Bartlett's Test on the Iowa Silent Reading Test (Use of Words) of the students who completed and did not complete the program instruction text in Phase II (1966)

Source	Sum of Squares	DF	Mean Square	F	F Probability
Columns	167.06	1	167.06	.97	.33
Within Cells	103364.85	598			
TOTAL	103531.91	599			
Bartlett's Test = .06 Probability of Chi Square with 1 DF = .80					

TABLE B-28.--Intercorrelations of selected variables Phase II (1966) r = .19 Significant at 1% level of confidence

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Quality Point Average	100	40	35	24	-08	42	23	29	44	35	37	25	35	-04	07
2. School I. Q.	40	100	47	32	-07	33	31	37	40	39	34	26	23	03	-12
3. Language I. Q.	35	47	100	37	05	36	44	52	60	53	37	24	18	-02	-17
4. Non-language I. Q.	24	32	37	100	05	08	10	26	21	20	13	12	14	-03	-06
5. Attitude Program Learn.	-08	-07	05	05	100	11	07	-05	06	-02	-02	-03	-17	-02	14
6. Reading Comprehension	42	33	36	08	11	100	41	36	53	47	50	27	34	05	-04
7. Directed Reading	23	31	44	10	07	41	100	52	49	37	31	36	13	-02	-01
8. Poetry Comprehension	29	37	52	26	-05	36	52	100	55	44	25	44	25	15	01
9. Word Meaning	44	40	60	21	06	53	49	55	100	57	47	35	28	00	-03
10. Sentence Meaning	35	39	53	20	-02	47	37	44	57	100	38	22	23	03	00
11. Paragraph Comprehension	37	34	37	13	-02	50	31	25	47	38	100	32	33	-11	00
12. Index	25	26	24	12	-03	27	36	44	35	22	32	100	31	08	06
13. Key Words	35	23	18	14	-17	34	13	25	28	23	33	31	100	-04	05
14. Program Instruction Examinations Completed	-04	03	-02	-03	-02	05	-02	15	00	03	-11	08	-04	100	-02
15. Sex	07	-12	-17	-06	-14	-04	-01	-01	-03	-00	00	06	05	-02	100

NAME____ DATE____________________

ATTITUDE INVENTORY NO. 1 *
N.D.E.A. TITLE VII - B PROJECT
CLARION STATE COLLEGE

The statements below represent varying attitudes toward the use of programed textbooks as a means of studying a subject. Read each statement and indicate the extent to which you agree or disagree with it by circling SA (Strongly Agree), A (Agree), U (Undecided or neutral), D (Disagree), or SD (Strongly Disagree).

1. Courses in which programed materials are used are dull and uninteresting. SA A U D SD
2. I feel that using programed materials is the most effective method of studying that I have ever used. SA A U D SD
3. I am glad that I am not using programed materials in more courses than I am at present. SA A U D SD
4. I do not like to work with programed materials. SA A U D SD
5. School would be more interesting if programed materials were used in more courses. SA A U D SD
6. I wish that I could study programed materials in my other courses. SA A U D SD
7. Using programed materials results in too much wasted time. SA A U D SD
8. Using programed materials is interesting because you have to keep thinking. SA A U D SD
9. I would rather be working with a group of classmates than working alone with a programed textbook. SA A U D SD
10. When I use programed materials, I can keep interested in my work. SA A U D SD
11. When I use programed materials, I understand everything that I study. SA A U D SD
12. I would rather have the teacher explain the subject than be left on my own with a programed text. SA A U D SD

* Adapted from "Attitude Inventory," an instrument through the courtesy of Dr. C. M. Lindvall, Associate Director, Learning Research and Development Center, University of Pittsburgh.

TABLE B-29.--Means, standard deviations and intercorrelations of items on attitude toward programed instruction inventory

Items	1	2	3	4	5	6	7	8	9	10	11	12	*Mean	S.D.
1. Courses in which programed materials are used are dull and uninteresting.		-.27	.40	.44	-.32	-.39	.45	-.54	.36	-.41	-.16	.38	2.46	1.02
2. I feel that using programed materials is the most effective method of studying that I have ever used.			-.43	-.46	.61	.54	-.10	.24	-.32	.38	-.02	-.30	2.34	.95
3. I am glad that I am not using programed materials in more courses than I an at present.				.49	-.66	-.66	.23	-.36	.46	-.42	-.14	.34	3.24	1.07
4. I do not like to work with programed materials.					-.54	-.57	.53	-.54	.38	-.53	-.17	.32	2.23	.99
5. School would be more interesting if programed materials were used in more courses.						.82	-.30	.40	-.51	.45	.19	-.36	2.62	1.15
6. I wish that I could study programed materials in my other courses.							-.30	.35	-.49	.43	.10	-.45	2.78	1.06
7. Using programed materials results in too much wasted time.								-.45	.21	-.37	-.13	.29	2.14	1.04
8. Using programed materials is interesting because you have to keep thinking.									-.33	.55	.13	-.31	3.54	.98
9. I would rather be working with a group of classmates than working alone with a programed text.										-.37	-.13	.64	3.71	.96
10. When I use programed materials, I can keep interested in my work.											-.16	-.39	2.97	.99
11. When I use programed materials, I understand everything that I study.												-.19	2.52	1.06
12. I would rather have the teacher explain the subject than be left on my own with a programed text.													2.45	1.00

*The items were scored with an assignment of 5 to the most positive and 1 to the most negative response.

TABLE B-30.--Attitude toward programed instruction - rotated varimax factor structure (N=89)*

ITEM	FACTOR I	FACTOR II	FACTOR III	FACTOR IV	FACTOR V	FACTOR VI	h2
1. Courses in which programed materials are used are dull and uninteresting.	-.19	.19	-.04	.23	-.21	.78	.77
2. I feel that using programed materials is the most effective method of studying that I have ever used.	.67	-.38	-.12	-.13	-.06	-.05	.62
3. I am glad that I am not using programed materials in more courses than I am at present.	-.72	.05	-.09	.18	-.04	.35	.69
4. I do not like to work with programed materials.	-.49	.43	-.08	.10	-.44	.19	.67
5. School would be more interesting if programed materials were used in more courses.	.85	-.17	.11	-.20	.14	-.09	.85
6. I wish that I could study programed materials in my other courses.	.83	-.09	.03	-.27	.18	-.14	.81
7. Using programed materials results in too much wasted time.	-.10	.17	-.05	.13	-.91	.21	.94
8. Using programed materials is interesting because you have to keep thinking.	.17	-.55	.04	-.12	.24	-.53	.69
9. I would rather be working with a group of classmates than working alone with a programed textbook.	-.36	.10	-.05	.74	-.02	.18	.72
10. When I use programed materials, I can keep interested in my work.	.28	-.74	.08	-.22	.15	-.18	.74
11. When I use programed materials, I understand everything that I study.	.05	-.07	.98	-.07	.05	-.06	.98
12. I would rather have the teacher explain the subject than be left on my own with a programed text.	-.17	.16	-.09	.86	-.13	.09	.85
Total sum of sq.	2.93	1.32	1.03	1.60	1.22	1.20	
Percent of communality	28%	12%	10%	15%	12%	11%	88%
Total communality = 10.62 (trace) for analysis							

*The reliability for this sample using analysis of variance technique was .88.

ATTITUDE TOWARD PROGRAMED INSTRUCTION INVENTORY

The Attitude Toward Programed Instruction Inventory proved to be a measure that discriminated between the completion and noncompletion groups of students.

In order to understand the factor structure of the inventory a random sample of eighty-nine students' responses to the twelve items was factor analyzed.

The Attitude Toward Programed Instruction Inventory was scored on a five-point scale with five being positive and one negative. Table B-29 summarizes the means, standard deviations and intercorrelations of items on the inventory. The items were scored and means, standard deviations and intercorrelations for the items were computed. The results of the correlation were factor analyzed using the principal axis method and the resulting factors were rotated using the varimax method.

Table B-30 shows the rotated varimax factor loadings. The results of the rotation show six factors explaining 88% of the variance after three iterations. The first factor accounted for twenty-eight percent of the variance. The loadings were bipolar on the factor with items two, five and six reflecting a positive attitude toward programed instruction and items three and four reflecting a negative attitude. This factor was identified as the appeal factor.

Factor II, which accounted for twelve percent of the variance, with items ten and eight accounting for most of the variance, appears to be an interest factor. This factor had moderate to high loadings on items eight and ten.

Factor II accounts for ten percent of variance with item eleven explaining the majority of the variance. This item has been identified as an awareness factor.

Factor IV accounted for fifteen percent of the variance and two items, nine and twelve, explained the factor. This factor appeared to be a dependence factor.

Factor V had item seven accounting for twelve percent of the variance, while one and eight accounted for eleven percent of the variance in Factor VI. Factor VI appears to be a factor which reflects interest in programed instruction.

APPENDIX C

UNIT TESTS COMPLETED IN PHASES I AND II

TABLE C-1.--Unit tests completed (first year)

Subject	Number of Students	Unit Tests Completed					
		1	2	3	4	5	6
Statistics	434	299	117	50	13	4	4(F)
% of Students		69	27	12	3	1	1
Human Behavior	434	153	35	21	14	11(F)	
% of Students		36	8	5	3	3	

Total number of students -- 434
Number of units completed -- 15
Percentage of students completing programs -- 3.4

TABLE C-2.--Unit tests completed (second year)

Subject	Number of Students	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Genetics	170	119	106	100	92	78(F)	71	61	54	44	40	37	33	30	30	30	29	29	29	28
% of Students		71	63	60	55	46	42	36	32	26	24	22	20	18	18	18	17	17	17	17
Human Behavior	65	30	15	13	12	9(F)														
% of Students		46	23	20	17	14														
Mathematics	128	82	51	13	12	30														
% of Students		64	40	30	26	23														
Social Behavior	81	31	25	22(F)																
% of Students		38	31	27																
Spelling	154	123	105	95	90	82	74	71	69	65	64	63	63	63(F)						
% of Students		81	69	63	59	54	49	47	45	43	42	41	41	41						
Statistics	2	1					(F)													
% of Students		50																		

Total number of students -- 600
Number of programs completed -- 152
Percent of students completing programs -- 25

APPENDIX D

ANECDOTAL RECORD MAINTAINED BY THE RESEARCH ASSISTANTS ON STUDENTS FOR PHASE I

The greatest factor affecting student progress throughout the school year was given by students as being lack of time--they repeatedly said that there just was not enough time for them to work as much as they wanted. This lack of time was due primarily to pressure of other school work and sometimes due to participation in extra curricular activities and sports. In any time remaining at the end of the day, many students were too fatigued or lacked sufficient drive or motivation to work on programed materials. In any extra available time for study, students preferred to study their school work in order to earn a better grade. Of course, in some cases, a few students just lost interest in the project. Students were obtained using the following procedures.

After the superior students in each school had been identified, a meeting was held for the purpose of explaining the project to them. At this meeting the following questions are typical of those asked by the students:

1. How much time will this require?

2. Will I have to work on this every day?

3. What happens if I volunteer for the project and am unable to complete the work?

4. Will I have to work on both programs?

5. Will I receive any credit for this work?

In addition to these questions the research assistants made the following observations:

Parents wanted her to participate, but she felt her load was too heavy as it was. Her wishes prevailed in this case.

Students at one school expressed concern at the orientation meeting that they would be given grades for their work. They were relieved to hear that no grades were involved.

One student, in particular, lost interest during the first semester while studying statistics and decided to drop out of our project. However, when she learned that the second course was Human Behavior she revived her interest and decided to stay in the project.

One girl told me she was not particularly interested in statistics or mathematics but she did not want left out of the humanities program planned for the second semester.

One student reported that working on programed materials for 30 minutes "was enough".

Students in general say that material is "rough" but they are able to understand it if they stick to the job.

One student, when asked how she liked programed instruction, replied that it was "fun" and "different".

It was found that the seniors in one of the schools were exerting pressure on other members of the senior class who were ready to take their first test. They were trying to persuade them not to take the test and make them look "bad" or put the pressure on them to exert more effort on the program.

Students at one high school were apprehensive about seeing the research assistant face to face. They exhibited a guilt complex because of their slow progress in completion of the program.

A few of the students expressed a desire to drop from the project and become a part of the population of another talented youth program. They were informed that if they did drop out of this project they would not be considered for selection in the talented youth project. They all then decided to remain in this project.

One of the students stated that one of his teachers and the research assistant made him feel guilty about his lack of satisfactory progress. He said also that some of his teachers call him lazy.

One student requested an English program to be used as a "refresher" course this summer prior to college entry this fall term. He also wanted to know if it would be possible for him to have an appointment with the project director. He wanted to talk to him and personally thank him for being afforded the opportunity to participate in the program this year.

One of the project students, whose father had taken his program away from him, talked to me today and requested the use of the program for the summer. The student wanted to complete the program. The student indicated it was not his usual habit of not finishing what he had set out to do.

In one particular school, student interest in the second program was high; six additional students requested permission to enter the program. These students were accomodated because we had some students drop out during the first semester.

Some students in one high school asked permission to keep their copies of Human Behavior after the close of the school year; they were hoping to have some time to work on them. Permission was granted.

The following comments were made by the students:

"I get bored doing it (statistics) and it doesn't interest me very much. It's hard to concentrate on the material but you need to concentrate to learn it."

"I like the programed learning but I hate mathematics. My parents don't think I spend enough time on it."

"I find that I am becoming uninterested in the statistical part of the course. I think that it would be more interesting to me if I could see a definite application to it or if there was a different course that would appeal."

One student's reaction to Human Behavior: "Material is harder that statistics." She thought that being able to write in the book was helpful; she also liked the review at the end of each chapter. After completing chapter eleven, she enthusiastically said, "I like it!"

"It is interesting to me but not more interesting than my regular homework. It is sometimes a little difficult to fully understand."

"The material (statistics) is easy to work on, but I don't enjoy it as much as I thought I would. It's too easy to find challenging."

"I enjoy working with it, since it offers new material to learn. I feel as if I'm under a little pressure, though, as to keeping up with the other students and finishing in time. But I don't regret taking it."

"I have found this interesting because it is a new field of mathematics. I enjoyed working on it when I didn't have other things to do, but if I had other things that had to be done, I found myself pushing this aside and not even thinking about it."

"I wish that there was more time for the course; my work is rather slow and my teachers told me not to be involved in so many extra curricular activities. Actually, the course is interesting if one has the time to really dig in."

"I enjoy doing it but I never seem to have enough time to do it. I have been having quite a bit of homework and sometimes I forget about it."

"I like ordinary teaching better because each day you're in the class about 45 minutes and the teacher gives out homework that you have to do and I think I could learn more through ordinary teaching."

"I like Human Behavior much more than statistics because it is easier to understand and much of it is just common sense."

"I think that the material is presented in an excellent manner, however, more space should be provided for the responses. I think that the subject is very interesting and that the program is definitely worthwhile."

"Programed instruction is better than regular teaching because you can work at your own speed and don't have to worry about homework."

"I like it even though sometimes it is hard to find time to work on it."

"I like the course very much. One can study the course at his own speed. This way he doesn't get bored as he might in class by going too slow. Neither would he get confused by the material being covered too fast, as might be done in class. The information is reviewed several times and makes one less likely to forget it. One can easily understand the relationships in the information as it is developed."

"I very much enjoy Human Behavior. I think it has more immediate practical applications than did statistics. It would help if there were a slide to cover the answers and more room to write the answers."

"First time I've had a mathematics course I like."

"Vocabulary is difficult. Material (Human Behavior) requires a lot of concentration. Blanks and print are too small."

"I like it, but I just can't seem to find enough time for it. What I have done has been challenging and I like the challenge. If I could find more time I would get more out of it." (This comment concerning time occurred frequently.)

"I think it is easier to study this way."

"I think this way of learning is good; it is fairly easy. Sometimes I don't feel like sitting down and studying it, but after I start I like to keep going. It is very interesting."

"The only fault in the program I find is myself. I don't seem to be able to make myself work. The program seems to present the material in a way that is easy to understand."

"I think this teaching method could be used for students of high intelligence or ones with a great amount of initiative. For general use, I do not think it would work. I know that I have learned a great deal from it. I am glad that I chose to enter this course since I believe it will help me in my college years."

"I am very interested in the course and it's subject matter but I am finding it hard to set aside a certain portion of time to work on the course at a good pace."

"I think that this course in statistics is interesting and I really enjoy doing it -- when I have the time! I find that although I sometimes consume a lot of time, I do not always have the time because of extra-curricular activities and the many assignments in my other courses."

"It is a pleasant change and interesting."

"Many students found that if there was any time lapse between study sessions on the statistics that they had to spend time in review to regain the concept they were dealing with at that time."

Students felt that it would have been a help if they had been able to have written in the programs.

"At first I thought it would be too much work along with my regular studies but I have found this not to be true."

"I think it is harder to work on your own than with a teacher telling you what to do. But this way of studying should help prepare us for college."

"My regular classes at times seem so boring; but there is a teacher to push you and a class to compete with."

"It's hard to find time to do it, but it's easier if you set a goal for each day and try to stick to it. With no pressures of supervision, it's easier to learn."

"The course is helping me in my algebra, especially the part about graphing."

"I enjoy this statistics course or programed materials because it presents a challenge to me of seeing what I can accomplish on my own."

"This statistics study holds no interest for me. The only time I ever work on it, which is, as you can see, very seldom, is when I start feeling guilty about not doing more."

"I do not prefer this course to regular classroom courses because I would rather ask questions."

"Individual study of this type outranks by far regular classroom work, where a person has to review when he may not need to and may need to when the class doesn't."

"In order to absorb the material I have to discipline my concentration more than in doing regular homework, which in our school is mostly busywork."

"The biggest advantages of the program, I feel are these:

(1) I can learn self-discipline and individual thinking, both of which are lacking in our regular program.

(2) I am my own teacher. I don't have to endure a nonthought-provoking teacher who teaches a dull class. If it's dull working on the program it's my own fault."

"In order to learn anything from these programed materials, I have to have the right atmosphere to study. It's not like a lot of school work which you can do without complete concentration."

"This way of studying would be easier for me if it was in a classroom where a question could immediately be answered."

"In the classroom you have to move with the group. In self-instruction you can move at your own speed."

"I find this very effective. I think it is a great way to teach, but I think classroom drill is still the best for me."

"Many teachers will be happy to hear my comments, for I feel nothing can replace their teaching."

"It is a good way to get in needed courses and it would make for good refresher courses."

"I found I had a very good start, but have lost some of the enthusiasm that I had formerly held. Proper motivation may be the answer."

"I like going at my own speed, rather than slowing down for someone else."

"I am rather surprised at how easy it is and how much I have learned. I kind of thought at first that I would learn very little because I wondered what there was to reading a few sentences and filling in some blanks."

"Trying to keep up other grades seems only to allow time to work on this over the weekend."

"My parents feel this course will prove helpful if I can find time to do it along with my regular studies."

"Every time my mother screams 'work on your project from the college' I work furiously for twenty minutes."

"I find it takes very little of my time as compared to the benefit I receive from it."

"I really don't see how this course is going to be helpful unless we go into the field of statistics."

"I really like this method. Sometimes, when I am mad at the teachers, I wish all my courses were taught in this manner."

"When I do try to work on my program during the week I make sure I've finished my regular homework because I get so involved in it I tend to forget my regular studies."

"I have found things in my school studies and college board test that I did relate back to the programed materials studied."

Student "A" (Girl)

I feel that, though this project is usually understandable, having a teacher reading and explaining the information helps more in learning. I've found that before I start each evening, I have to review the past couple of nights lessons in order to recall it. Another point that bothers me some is that the terminology used is often different from a classroom teacher's word usage. Usually I can remember, but sometimes I have to look back to the definitions. But, as a whole, I feel I am learning some further knowledge I would not receive in the classroom.

Student "B" (Boy)

I feel that programed learning is successful. If one learns the material as he covers it, the program can be substituted for the regular classroom activites.

In my work I found how completely essential it is to understand each detail. My failure to attempt absolute comprehension forced me to spend my daily periods of about one half hour in review of materials. I now realize that since this course calls for considerable condensation of material, details must be understood.

I now have to budget my time in order to get at least one half hour a day for statistics. By using a time schedule listing subjects in, what I consider their importance. (The most important first.)

I know that my progress in terms of pages is quite slow, but I can accredit the lack of clarity in my pace to the must of understanding the basic principles.

I would like to have some idea of how fast I should be moving so that I can allot more time if necessary. This extra time might limit my attendance to various activities, but I rather think that I could find time if I knew that an acceleration of study was necessary. Therefore, it is my opinion that if those administering the test would suggest a completion date, I would work harder. If it is felt by those conducting the program that a completion date would put too much pressure on the student, I think that the establishment of a rate such as a number of pages a day should be established, if only suggestive. Otherwise I have the feeling that I might as well do something else.

Student "C" (Boy)

I feel that this course can be effective if a student can discipline himself to study it everyday. This is the greatest disadvantage.

I am beginning to study with regularity. But as you can see it has taken two months to adjust.

If days are missed, I feel that it is necessary to review the material to refamiliarize with the lesson.

A meeting with some kind of instructor would help in understanding the course. I find that there are times when I answer a frame with an answer that I think can fit but is different from the given answer. An instructor would help in interpreting whether or not these possibly correct answers are right or not.

Student "D" (Girl)

The main problem I have is time to spend on the course, obviously. I don't have to review much when I go back to the book, but I have to go over the material several times when I read it for the first time.

Individual study of this type outranks by far regular classroom work where a person has to review when he may not need to and may need to when the class doesn't.

In order to absorb the materials I have to discipline my concentration more than in doing regular homework, which in our school is mostly busywork.

The biggest advantages of the program, I feel, are these:

1. I can learn self-discipline and individual thinking, both of which are lacking in (the school's) regular program.
2. I am my own teacher. I don't have to endure a nonthought-provoking teacher who teaches a dull class. If it's dull working on the program, it's my own fault.

Student "E" (Boy)

This statistics study holds no interest for me. The only time I ever work on it, which is, as you can see, very seldom, when I start feeling guilty about not doing more.

Even though I work on it so little, I find that when I go back to the work after a week I have lost little. The constant drill and repetition (which is very boring) could not help but make us learn. I don't have to go back and relearn anything; the little reviews and questions thrown in here and there help me recall previous work.

The main reason that I don't put time into this work is that I have many other activities of much more interest to me. I will, however, have much more time to put into such a project second semester, when I will have study halls. This is the busiest year I have yet encountered in school and I wish I had more time to put in to other activities (though not necessarily into statistics). More and more my interest turns away from school-course type field.

Student "F" (Girl)

So far, I am enjoying the program. The time does not seem to be a big handicap; I usually do about 10-20 minutes of it with my homework. However, I haven't done much the past three weeks because of my schedule. Yesterday, however, I started to work again. I didn't make much progress though, because I had to review about 10 pages that I seemed to have forgotten. But it came back very easily, so it must be sticking with me. So far, I know I haven't made too much progress, but I hope to work harder over Christmas vacation and I think I will. I have no trouble remembering the information for a few days. I have enjoyed this program, and find it very interesting.

Student "G" (Boy)

This program began easily, and, I thought, would only familiarize me with terms used in Statistics. Now, however, the real purpose and practical use has appeared, and I find that I must slow down and concentrate much harder each time. The method used for instruction is, I think, excellent. I like the way the text repeats terms, gives examples, and presents the new material. After the first test I found that I must work harder not to just memorize terms, but also to learn how to understand their meaning. I would much rather learn the material the way I am now than to have someone teach it to me because I can go back specifically to a point where I have become confused and straighten myself out.

APPENDIX E

STUDENT QUESTIONNAIRE

NAME OF SCHOOL ____

NAME OF STUDENT ____

PROGRAMED INSTRUCTION TEXT:

_____ Sets, Relations, Functions	_____ Social Behavior
_____ Genetics	_____ Spelling Improvement
_____ Human Behavior	_____ Statistics

TIME SCHEDULE FOLLOWED:

A. Daily

_______ 15 minutes	_______ one hour
_______ 30 minutes	_______ other, please specify

B. Weekly

_______ one day	_______ four days
_______ two days	_______ five days
_______ three days	_______ other, please specify

C. Total number of hours devoted to programed learning to date?

____

NUMBER OF TESTS TAKEN TO DATE:

_____ one	_____ three	_____ five	_____ seven	_____ nine
_____ two	_____ four	_____ six	_____ eight	_____ ten

APPROXIMATE DATE OF LAST TEST ______________________________

NUMBER OF FRAMES COMPLETED TO DATE _________________________

OF WHAT VALUE HAD THIS PROGRAMED LEARNING EXPERIENCE BEEN TO YOU?

____

____

____

WHAT DO YOU SEE AS ADVANTAGES IN FAVOR OF USING PROGRAMED INSTRUCTION AS COMPARED TO YOUR REGULAR CLASSROOM WORK?

____

____

____

ONLY FOR THOSE WHO COMPLETED A PROGRAMED TEXT

Name of text completed ______________________________

Time taken to complete text ____________________ hours ______

WHAT DO YOU SEE AS DISADVANTAGES?

____

____

____

APPENDIX F

ANECDOTAL RECORD MAINTAINED ON TEACHERS FOR PHASE I

Guidance counselors and teachers who served as liason personnel during the project gave their wholehearted cooperation and assistance. They seemed to be highly interested in their students' progress, and became quite concerned when this progress was less than anticipated. In general, they felt that our project should include more motivation for the student -- they felt that many students were unable to provide their own motivation. Following are a few instances of their activities:

A drop out in one school made room for a replacement. This replacement was made by the guidance counselor and was satisfactory to the project staff.

The guidance counselor at one particular school had a meeting with our project students and tried to encourage them. Results of this meeting were as follows:

1. Students would like a choice of subject matter.
2. Many students felt that English would be more appealing.
3. There was a general lack of interest in mathematics.

Several liason personnel mentioned that they thought more motivation should be included in the program. This motivation might be something as simple as a luncheon for the participating students.

Many of the teachers who were not directly involved with the project in the cooperating schools did not really understand what the aims or objectives of the project were. This became apparent as the project progressed and occasional conversations were held with these teachers. It was difficult for many of them to distinguish between an experimental research study and a demonstration project.

There were instances of growing interest in the use of programed materials which the following situations seem to substantiate.

A number of teachers requested the use of one or more of our programs for their own personal use. They gave a variety of reasons for wanting to use the programs. Some believed they would be helpful in their own graduate studies. Others wanted to orient themselves with the particular programs we were using, in order to be able to speak intelligently to the project students who may come to them with questions. There were requests from teachers, whose children were not a part of our project population, who wanted access to the programs so that their children would have an opportunity to acquaint themselves with this type of self-study material.

There were instances of resistance to innovation as the project progressed through the course of the school year. Quoting one teacher, his reaction was this, "It will never work. Students will not accomplish or learn anything when they are permitted to work wholly on their own and they are not supervised."

Another said, "It takes many more volumes of programed materials to teach a subject than with an ordinary textbook so this makes it impractical."

APPENDIX G

SEMANTIC DIFFERENTIAL SCALE

INSTRUCTIONS

The purpose of this study is to measure the meanings of certain concepts to various people by having them judge these concepts against a series of descriptive scales. In completing this form, please make your judgments on the basis of what these concepts mean to you. Along the left handmargin of each of the following pages, you will find a different concept to be judged and beside it a set of scales. You are to rate the concept on each of these scales in order.

Here is how you are to use these scales:

If you feel that the concept at the left of the page is very closely related to the end of the scale, you should place your check-mark as follows:

Good__X__:_____:_____:_____:_____:_____:_____Bad
or
Good_____:_____:_____:_____:_____:_____:__X__Bad

If you feel that the concept is quite closely related to one or the other end of the scale (but not extremely), you should place your check marks as follows:

Strong_____:__X__:_____:_____:_____:_____:_____Weak
or
Strong_____:_____:_____:_____:_____:__X__:_____Weak

If the concept seems only slightly related to one side as opposed to the other side (but not really neutral), then you should check as follows:

Active_____:_____:__X__:_____:_____:_____:_____Passive
or
Active_____:_____:_____:_____:__X__:_____:_____Passive

The direction toward which you check, of course, depends upon which of the two ends of the scale seems most characteristic of the thing you are judging.

If you consider the concept to be neutral on the scale, both sides of the scale equally associated with the concept, or if the scale is completely irrelevant, unrelated to the concept, then you should place your check-mark in the middle space:

Good_____:_____:_____:__X__:_____:_____:_____Bad

IMPORTANT: (1) Place your check-marks in the middle of spaces, not on the boundaries:

This   Not This
_____:_____:_____:__X__:_____X_____:_____

(2) Be sure you check every scale for every concept. Do not omit any.

(3) Never put more than one check-mark on a single scale.

Sometimes you may feel that you have had the same item before. This will not be the case, so do not look back and forth through the items. Do not try to remember how you checked similar items earlier. Make a separate and independent judgment for each item. Work at fairly high speed and do not worry or puzzle over individual items. It is your first impressions (the immediate "feelings" about the items) that we want. On the other hand, please do not be careless, because we want your true impressions.

SEMANTIC DIFFERENTIAL SCALE

Programed Learning

1. LINEAR....................Good_____:_____:_____:_____:_____:_____:_____Bad
2. PROGRAMED TEXT............Good_____:_____:_____:_____:_____:_____:_____Bad
3. CORRECT RESPONSE..........Good_____:_____:_____:_____:_____:_____:_____Bad
4. SMALL STEPS...............Good_____:_____:_____:_____:_____:_____:_____Bad
5. STIMULUS ITEMS............Good_____:_____:_____:_____:_____:_____:_____Bad
6. IMMEDIATE CONFIRMATION....Good_____:_____:_____:_____:_____:_____:_____Bad
7. SELF-INSTRUCTION..........Good_____:_____:_____:_____:_____:_____:_____Bad
8. SELF-PACING...............Good_____:_____:_____:_____:_____:_____:_____Bad
9. READABILITY...............Good_____:_____:_____:_____:_____:_____:_____Bad
10. REPETITIVE...............Good_____:_____:_____:_____:_____:_____:_____Bad
11. FEEDBACK.................Good_____:_____:_____:_____:_____:_____:_____Bad
12. BRANCHING................Good_____:_____:_____:_____:_____:_____:_____Bad
13. CUEING...................Good_____:_____:_____:_____:_____:_____:_____Bad
14. MASKING..................Good_____:_____:_____:_____:_____:_____:_____Bad
15. LOGICAL SEQUENCE.........Good_____:_____:_____:_____:_____:_____:_____Bad
16. INDIVIDUAL DIFFERENCES....Good_____:_____:_____:_____:_____:_____:_____Bad
17. FRAMES...................Good_____:_____:_____:_____:_____:_____:_____Bad
18. ACTIVE RESPONSE..........Good_____:_____:_____:_____:_____:_____:_____Bad
19. VERBALIZATION............Good_____:_____:_____:_____:_____:_____:_____Bad
20. REINFORCEMENT............Good_____:_____:_____:_____:_____:_____:_____Bad

1. LINEAR....................Strong____:____:____:____:____:____:____Weak
2. PROGRAMED TEXT............Strong____:____:____:____:____:____:____Weak
3. CORRECT RESPONSE..........Strong____:____:____:____:____:____:____Weak
4. SMALL STEPS...............Strong____:____:____:____:____:____:____Weak
5. STIMULUS ITEMS............Strong____:____:____:____:____:____:____Weak
6. IMMEDIATE CONFIRMATION....Strong____:____:____:____:____:____:____Weak
7. SELF-INSTRUCTION..........Strong____:____:____:____:____:____:____Weak
8. SELF-PACING...............Strong____:____:____:____:____:____:____Weak
9. READABILITY...............Strong____:____:____:____:____:____:____Weak
10. REPETITIVE................Strong____:____:____:____:____:____:____Weak
11. FEEDBACK..................Strong____:____:____:____:____:____:____Weak
12. BRANCHING.................Strong____:____:____:____:____:____:____Weak
13. CUEING....................Strong____:____:____:____:____:____:____Weak
14. MASKING...................Strong____:____:____:____:____:____:____Weak
15. LOGICAL SEQUENCE..........Strong____:____:____:____:____:____:____Weak
16. INDIVIDUAL DIFFERENCES....Strong____:____:____:____:____:____:____Weak
17. FRAMES....................Strong____:____:____:____:____:____:____Weak
18. ACTIVE RESPONSE...........Strong____:____:____:____:____:____:____Weak
19. VERBALIZATION.............Strong____:____:____:____:____:____:____Weak
20. REINFORCEMENT.............Strong____:____:____:____:____:____:____Weak

1. LINEAR.......................Active___:___:___:___:___:___:___Passive
2. PROGRAMED TEXT...............Active___:___:___:___:___:___:___Passive
3. CORRECT RESPONSE.............Active___:___:___:___:___:___:___Passive
4. SMALL STEPS..................Active___:___:___:___:___:___:___Passive
5. STIMULUS ITEMS...............Active___:___:___:___:___:___:___Passive
6. IMMEDIATE CONFIRMATION.......Active___:___:___:___:___:___:___Passive
7. SELF-INSTRUCTION.............Active___:___:___:___:___:___:___Passive
8. SELF-PACING..................Active___:___:___:___:___:___:___Passive
9. READABILITY..................Active___:___:___:___:___:___:___Passive
10. REPETITIVE...................Active___:___:___:___:___:___:___Passive
11. FEEDBACK.....................Active___:___:___:___:___:___:___Passive
12. BRANCHING....................Active___:___:___:___:___:___:___Passive
13. CUEING.......................Active___:___:___:___:___:___:___Passive
14. MASKING......................Active___:___:___:___:___:___:___Passive
15. LOGICAL SEQUENCE.............Active___:___:___:___:___:___:___Passive
16. INDIVIDUAL DIFFERENCES.......Active___:___:___:___:___:___:___Passive
17. FRAMES.......................Active___:___:___:___:___:___:___Passive
18. ACTIVE RESPONSE..............Active___:___:___:___:___:___:___Passive
19. VERBALIZATION................Active___:___:___:___:___:___:___Passive
20. REINFORCEMENT................Active___:___:___:___:___:___:___Passive

APPENDIX H

TEACHER QUESTIONNAIRE

NAME OF SCHOOL ______________________________

NAME OF TEACHER ______________________________

YEARS OF TEACHING EXPERIENCE ______________

SUBJECT FOR WHICH PROGRAM WILL BE USED ____________ GRADE ____

1. Have you ever used programed materials?

   ______ No

   ______ Yes, please specify ______________________

2. To your knowledge, has your school ever used programed materials other than those used in this project?

   ______ No

   ______ Yes, please specify ______________________

3. How do you anticipate using the programed learning materials which you have selected?

   ____

   ____

4. What do you see as advantages in using programed instruction?

   ____

   ____

5. What do you see as the disadvantages?

   ____

   ____

6. Please check your major source of information on programed materials:

_______ Newspapers and magazines

_______ Professional publications

_______ Colleague

_______ Salesmen

_______ Other, please specify _______________________________

7. Which of the following measures regarding programed instruction have been taken in your school system (project included)?

_______ A school meeting

_______ Set up a planning group

_______ Appointed a program director

_______ Sent staff to a workshop on programed instruction

_______ Utilized consultants

8. On the basis of your present knowledge about programed instruction, how would you rate your present reaction to it?

_______ Enthusiastic

_______ Favorable

_______ Neutral

_______ Opposed

_______ Strongly opposed

9. For which of the following would you like to have more information concerning programed learning?

_______ What other schools are doing

_______ Ways of utilization

_______ Programs available

_______ Program construction

_______ Research being done

10. What other materials do you think you might use in conjunction with the program you have selected?

________ Regular texts

________ Moving pictures

________ Film strips

________ Slides

________ Overhead projectors

________ Tape recorders

________ Phonographs

11. How do you anticipate using the programed learning materials?

________ Remedial work

________ Regular instruction

________ Supplement

________ Enrichment

________ Review

________ Combination of above

________ Other, please specify ______________________________

12. What testing devices do you plan to use to evaluate student achievement?

________ Standardized

________ Published supplied

________ Teacher constructed

________ Other, please specify ______________________________

13. What do you anticipate your role will be when using this material in the classroom?

________ Active teacher assistance

________ Available only for questions

________ Proctor only

________ Other, please specify ______________________________

14. How much time do you plan to devote to programed instruction?
A. Daily

_______ 5 min. - 20 min.

_______ 20 min. - 45 min.

_______ 45 min. - 1½ hours

_______ Over 1½ hours

_______ Other, please specify _______________

B. Weekly

_______ 1 day

_______ 2 days

_______ 3 days

_______ 4 days

_______ 5 days

_______ Other, please specify _______________

C. Anticipated length of program

_______ 1 week

_______ 2 - 3 weeks

_______ 4 - 6 weeks

_______ 16 - 18 weeks

_______ Don't know

15. What do you plan to do with the student who finishes the program in advance of his group?

____

____

APPENDIX I

SUMMARY OF RESPONSES TO TEACHER QUESTIONNAIRE

TABLE I-1--Summary of subjects taught by teachers selected for the project

SUBJECT FOR WHICH PROGRAM WILL BE USED		
	N.	%
English	9	43
Social Studies	4	19
Reading	1	5
Math	6	28
Science	1	5

TABLE I-2--Summary of responses to question one:

1. Have you ever used programed materials? ________ YES ________ NO		
	Yes	No
Number	5	16
Percent	24	76

TABLE I-3--Summary of responses to question two:

2. To your knowledge, has your school ever used programed materials other than those used in this project?

_______ YES _______ NO

	Yes	No
Number	10	11
Percent	48	52

TABLE I-4--Summary of responses to question three:

3. How do you anticipate using the programed learning materials which you have selected?

	Regular Instruction	Supplementary Instruction	Replace Text	Skill Development	Unknown
Number	11	4	1	1	4
Percent	52	19	5	5	19

TABLE I-5--Summary of responses to question four:

4. What do you see as advantages in using programed instruction?

	Skill Development	Well Structured and Organized	Individualized	Supplementary Materials	None
Number	7	2	7	1	3
Percent	33	10	33	5	19

TABLE I-6.--Summary of responses to question five:

5. What do you see as the disadvantages?

	Students bored, not interested	Student isn't required to think	Burden	Reading level too high	Not Clear	None
Number	6	1	1	1	2	10
Percent	29	5	5	5	9	47

TABLE I-7--Summary of responses to question six:

6. Please check your major source of information on programed materials:

	Newspapers and Magazines		Professional Publications		Colleague		Salesmen		Other (courses,etc.)	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
Number	11	10	6	15	3	18	4	17	8	13
Percent	52	48	29	71	14	86	19	81	38	62

TABLE I-8--Summary of responses to question eight:

8. On the basis of your present knowledge about programed instruction how would you rate your present reaction to it?

	Enthusiastic	Favorable	Neutral	Opposed	Strongly Opposed
Number	5	9	6	0	1
Percent	24	43	29	0	5

TABLE I-9--Summary of responses to question nine:

9. For which of the following would you like to have more information concerning programed learning?

	What other schools are doing?		Ways of utilization		Programs available		Program construction		Research being done	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
Number	8	13	18	3	7	14	4	17	7	14
Percent	38	62	86	14	33	67	19	81	33	67

TABLE I-10--Summary of responses to question ten:

10. What other materials do you think you might use in conjunction with the program you have selected?

	Regular Texts		Moving Pictures		Film Strips		Slides		Overhead Projectors		Tape Recorders		Phonographs	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
Number	14	7	8	13	4	17	1	20	5	16	5	16	4	17
Percent	67	33	38	62	19	81	5	95	24	76	24	76	19	81

TABLE I-11--Summary of responses to question eleven:

11. How do you anticipate using the programed learning materials?

	Regular Text		Regular Instruction		Supplement		Enrichment		Review		Combination of above		Not Sure	
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
Number	1	20	16	5	4	17	5	16	0	21	3	18	2	19
Percent	5	95	76	24	19	81	24	76	0	100	14	86	10	90

TABLE I-12--Summary of responses to question twelve:

12. What testing devices do you plan to use to evaluate student achievement?						
	Standardized		Publisher Supplied		Teacher constructed	
	YES	NO	YES	NO	YES	NO
Number	9	12	8	13	13	8
Percent	43	57	38	62	62	38

TABLE I-13--Summary of responses to question thirteen:

13. What do you anticipate your role will be when using this material in the classroom?						
	Active teacher assistance		Available only for questions		Proctor only	
	YES	NO	YES	NO	YES	NO
Number	18	3	5	16	0	21
Percent	86	14	24	76	0	100

TABLE I-14--Summary of responses to question fourteen:

14. How much time do you plan to devote to programed instruction?				
A. Daily	5 min.- 20 min.	20 min.- 45 min.	45 min.- 1½ hours	Over 1½ hours
Number	2	15	1	3
Percent	10	71	5	14

TABLE I-15--Summary of question fourteen continued:

B. Weekly	1 day	2 days	3 days	4 days	5 days
Number	6	1	2	2	10
Percent	29	5	10	10	47

TABLE I-16--Summary of responses to question fourteen continued:

C. Anticipated length of Program	1 week	2-3 weeks	4-6 weeks	16-18 weeks	Don't know
Number	1	2	8	9	1
Percent	5	10	38	42	5

TABLE I-17--Summary of responses to question fifteen:

15. What do you plan to do with the student who finishes the program in advance of his group?					
	Continued use if Successful	Additional Assignments	Individual Research	Keep class at same level	Don't know
Number	5	1	12	2	1
Percent	23	5	57	10	5

APPENDIX J

TITLE VII-B NEWS NOTES

Title VII-B News Notes

VOL. I, NO. I CLARION AND SLIPPERY ROCK STATE COLLEGES JANUARY, 1966

PROGRAMED INSTRUCTION BEGINS FEBRUARY FOR ENTIRE CLASSES

Beginning in February, the newest development of the project to study the effect of programed instruction in the high school will include entire classes. A selected teacher from each of twenty schools in northwestern Pennsylvahia will use a programed text which he has chosen himself to supplement or replace a text which he has formerly used, and will use it for his class as he chooses. With the classroom phase, the project staff hopes to be able to compare an entire class using programed materials under instruction with the individual student using the materials on his own time. The following schools and teachers are participating in the study:

Slippery Rock High School—Mrs. Joan Martin
Allegheny-Clarion Valley—Mr. Jay B. Gallagher
Wilmington Area High School—Mr. William Haltpunen
Union Area Jr.-Sr. High School—Mr. David L. Amodie
Laurel High School—Mr. Robert J. Miller
Moniteau High School—Mr. David F. Graham
Fairview Township-Karns City—Mr. Joseph Fair
Seneca Valley High School—Mrs. Mary McCabe
Knox High School—Mr. Bernard Moskowitz
Mars Area High School—Mrs. E. B Lecrone
Shenango Valley High School—Mrs. Roger Bradley
Keystone High School—Mr. Harold Fulton
Clarion-Limestone High School—Mrs. Isobel Maslar
Clarion Area School—Miss Mary Jane Miller
West Forest High School—Mrs. Mary Haslet
East Forest Joint High School—Mr. Larry Kisko
North Clarion County High School—Mrs Esther Baker
Redbank Valley High School—Mr. Donald Burkett
Brookville Area Secondary—Mrs. Julia L. Tronzo

NEW PROJECT DIRECTOR NAMED

Project VII-B has a new Research Director appointed in October, 1965. He is Dr. John Mclain, formerly Laboratory School Director of Wisconsin State University in Lacrosse, Wisconsin. In addition to his work as Project Research Director, Dr. Mclain has also been appointed Director of Educational Research and Area Curriculum Coordinator of Clarion State College. Dr. Mclain has served as a teacher, principal, supervisor, and curriculum coordinator, and has done extensive work in organizing and coordinating committee work both on the national and local levels. He and his wife, Doris and two children, Lisa and John, live in Knox, Pa.

PROGRAMS PLACED IN SCHOOL LIBRARIES

As Project VII-B has as one of its functions the dissemination of programed materials in this area, programed texts are being placed by Research Assistants in all high school libraries requesting them. These texts will be available to students whenever needed to provide supplementary learning materials to them. By the end of the academic year 1965-66, your library should have a selection of programed materials for your use, provided free of charge by the project. Watch for these programs and when they appear on the shelves . . . use them. They can only prove themselves with use.

MEET YOUR RESEARCH ASSISTANT

DR. LLOYD JOHNSTON, Research Assistant for Area A comes to the research staff from Bellevernon, Pa., where he was principal of Bellmar High School. A Pennsylvanian, Dr. Johnston graduated from California State College and received his doctorate in Education from the University of Pittsburgh. In addition to serving as a high school principal, Dr. Johnston has also taught Industrial Arts in Latrobe, Pa., Hickory Twp. High School. The Johnstons have four school age children; Mary 9, Carol 7, Lloyd 6, and Gail 3. Their home is in Slippery Rock.

DR. ERNEST BERTY, Research Assistant for Area B, lives with his family in Monongahela and commutes from Slippery Rock to the schools in his area. Dr. Berty is a former Social Studies teacher in high school and has served as attendance officer in the Ringgold School District in Pennsylvania. He attended California State College and received his doctorate in Education from the University of Pittsburgh. The Bertys have a twelve-year-old daughter, Karen.

MR. FRANK PALAGGO is well known to students and professional personnel of the eleven high schools of Area C, Clarion State College, received his Masters degree in Educa- near Clarion State College. Mr. Palaggo, a graduate of tion from Pennsylvania State University where he is currently enrolled in a doctorate program. Mr. Palaggo, his wife Dona, and two children Andy 9 and Tina 7, live in New Bethlehem. Before joining the project, Mr. Palaggo taught Government and Economics at Redbank Valley High School in Pennsylvania.

SHUT-INS USE PROGRAMED TEXTS

Mr. Frank Palaggo, research assistant in Area C, reports students using project texts during illnesses at home. He cites the case of a student taking plane geometry, and forced by illness to miss class. Using homebound instruction with programed learning, he found on his return to class that not only had he maintained class pace but was a little beyond what his class was doing.

STUDENTS SELECT COURSES FOR PHASE II

In the individual study part of Phase II, students in the three areas surrounding and between Clarion and Slippery Rock State Colleges, selected their courses for the semester. The chart below gives each student's first selection only. You might make an interesting comparison between the course you selected and the courses others chose. The project staff would be interested in hearing from you about your choice. Talk with your project coordinator or write to the Project VII-B News Notes at Clarion State College. Your ideas about programed learning are important to the project staff.

	Genetics	Spelling	Sets, Relations Functions	Human Behavior	Social Behavior	Statistics	Total
AREA A							
Slippery Rock North	69	45	36	24	25	1	200
AREA B							
Slippery Rock South	53	34	34	33	29	1	184
AREA C							
Clarion	46	74	59	8	27	0	214

YOUR SCHOOL AND PROJECT VII-B

It is always a challenge to start a new project of this nature, and since programed instruction is a relatively new way of teaching, you and your school are helping the project staff introduce and explore its use in our area. Your school is one of thirty selected from the area surrounding Slippery Rock and Clarion State Colleges, to participate in a research project designed to measure the effectiveness of programed materials in the high school, and to discover new uses of the materials. Last year, the two colleges worked cooperatively with twenty high schools, and this year the project which has been extended for the current school year, 1965-66 will include ten additional high schools. The number of students in the program has increased from 400 to nearly 1200, and grade 9 has been added to the previous grades of 10, 11, and 12. Students working on programed materials this year will fall into two groups of approximately six hundred.

Group A consists of a highly selective group of about 600 "high ability" students who are working independently on one of the following programs: HUMAN BEHAVIOR, SOCIAL BEHAVIOR, GENETICS, SPELLING IMPROVEMENT, STATISTICS, AND SETS, RELATIONS AND FUNCTIONS. These students were chosen on the basis of ability and achievement.

Group B consists of 20 individual classes of students who will be working on a wider variety of programed materials. This group also consists of about 600 students. Each class of the 20 will be under the direction of a teacher selected by the administrator and the research staff. The teacher will select the program and text to use and will use it as he sees fit. After any of the 600 students working independently, completes a program, he may select another program for himself. A list of available texts is published in this newsletter and all are available without charge.

The project is made possible under the auspices of Title VII-B, N.E.D.A., and is under the direction of both Clarion State College, Dr. William Page, investigator, and Slippery Rock State College, Dr. Nelson Hale as co-investigator. The following schools were selected to participate and are listed along with each school's supervising principal, the principal and the school's project coordinator, who works directly with the research assistant.

Area A—Dr. Lloyd B. Johnston, Research Assistant

Foxburg—Allegheny-Clarion Valley Joint Schools. Supervising Principal, Mr. Budd B. Stewart; Principal, Mr. Chalmer Kenemuth; Pro. Co., Mr. Gary Hamil.

Karns City—Fairview Twp., Karns City High School Supervising Principal, Dr. Joseph McClymonds; Principal, Dr. Charles E. Hillard; Pro. Co., Mr. Calvin L. Stevens.

Mercer—Mercer High School Supervising Principal, Mr. Seth Gustin; Principal, Mr. Matthew Rausch; Pro. Co., Mr. D. A. Porter.

New Castle—Laurel High School Supervising Principal, Mr. Alfred F. Barnes; Principal Mr. Eugene V. Hill; Pro. Co., Mr. Samuel K. Weinschenk.

New Castle—Neshannock High School Supervising Principal, Mr. Thomas P. Smathers; Principal, Mr. Vern W. Alderson; Pro. Co., Mr. Norman Seaholm.

New Castle—Union Area Joint High School Supervising Principal, Mr W. E. McColgin; Principal, Mr. Arthur Zarone; Pro. Co., Mr. Jack Boggs.

New Wilmington—Wilmington High School Supervising Principal, Mr. Hugh Sherwood; Principal, Mr. David C. Lewis; Pro. Co., Mrs. Lola Christy.

Sandy Lake—Lakeview High School Supervising Principal, Mr. LeRoy Nutt; Principal, Mr. W. S Herrman, Jr. Pro. Co., Mr. Floyd Tingley

Slippery Rock—Slippery Rock Area Joint High School Supervising Principal, Mr. Neil Williams; Principal, Mr. Charles W. Bentel; Pro. Co., Mr. Larry C. Mickey.

West Sunbury—Montieau High School Supervising Principal, Mr. Foster McGarvey; Principal, Mr. Robert Hartnett; Pro. Co., Mrs. Marion West.

Area B—Dr. Ernest Berty, Research Assistant

Worthington—Worthington-West Franklin High School Supervising Principal, Mr. John H. McCoy; Principal, Mr. John H. McCoy; Pro. Co., Mr. Harry E. Rose.

Ellwood City—Riverside Junior-Senior High School Supervising Principal, Mr. Edward C. Schaffer; Principal, Mr. Leslie H. Mariett; Pro. Co., Mr. S Robert Marziano

Saxonburg—Knoch Jr.-Sr. High School Supervising Principal, Dr. L. B. Derickson; Principal, Mr. Andrew Herceg, Pro. Co., Mr. Keith Johns.

Mars—Mars Area Junior-Senior High Supervising Principal, Dr. Albert Manerino; Principal, Mr. John J. Dillon; Pro. Co., Mr. Robert Simmons.

Harmony—Seneca Valley High School Ass't Supervising Principal, Mr. Oliver Cashdollar; Principal, Mr. Frank Adamczyk; Pro. Co., Mr. James Jamison.

New Castle—Shenango High School Supervising Principal, Mr. Edwin C. Beatty; Principal, Mr. Anthony A. Venturella; Pro. Co., Mr. A. A. Venturella.

Industry—Western Beaver Junior-Senior High School Supervising Principal, Mr. Frank A. Meredith; Principal, Mr. Michael Arbutina; Pro Co., Mr John W. Hineman.

Freedom—Freedom Area Jr.-Sr. High School Supervising Principal, John B. Wahl; Principal, Mr Charles M Gongloff, Pro. Co., Mr. Thomas Skinner, Ass't Princ. Sr. High.

Bessemer—Mohawk Area Jr.-Sr. High School Supervising Principal, Mr. Manford E. Brockway; Principal, Mr. Charles Gongloff; Pro. Co., Mr. Thomas Skinner, Ass't Principal, Senior High.

Area C—Mr. Frank Palaggo, Research Assistant

Brookville—Brookville Area High School Supervising Principal, Mr. James L. Hysong; Principal, Mr. Fred Clarke; Pro. Co., Mrs. Kathryn Smith.

Brockway—Brockway Area High School Supervising Principal, Mr. Blair Rupert; Principal, Mr. C. Herbert Steele; Pro. Co., Miss Caroline Longwell .

Clarion—Clarion Area High School Supervising Principal, Mr. Herbert Schneider; Principal, Mr. L Robert Wiberg; Pro. Co., Mr. William Brochetti.

Strattanville—Clarion-Limestone Joint School Supervising Principal, Mr. M. M. Collett; Principal, Mr Fred L. Carl; Pro. Co., Mr. Richard Bailey.

Knox—Keystone Joint School. Supervising Principal, Mr. Blaine E. Elder; Principal, Mr. Welton E. Austin; Pro. Co., Mr. James Lines.

YOUR SCHOOL AND PROJECT VII-B

(Continued from preceeding page)

Leeper—North Clarion County Joint School Supervising Principal, Mr. Joseph L. Orlosky; Principal, Mr. Charles Jolley; Pro. Co., Mr. William Gilbert.

Marienville—East Forest Joint School Supervising Principal, Mr. Phillip Wallace; Principal, Mr. John Smrek, Pro. Co., Mr. Arthur Van Nort.

New Bethlehem—Redbank Valley High School Supervising Principal, Mr. Joseph Kata; Principal, Mr. Richard J Krepp; Pro. Co., Miss Twila Gruver.

Rimersburg—Union Joint High School Supervising Principal, Mr. B. G. Coriiss; Principal, Mr. M. J. O'Toole; Pro. Co., Mr. Adam Vlanich.

Tionesta—West Forest Joint High School Supervising Principal, Mr. Philip Wallace; Principal. Mr. D. H. Hiwiller; Pro. Co., Mr. Norman Sherman.

Tidioute—Tidioute Jr.-Sr. High School Supervising Principal, Mr. Charles Anderson; Principal, Mrs. Charles Anderson; Pro. Co., Mr. Anderson.

NEW PROGRAMS AVAILABLE TO YOU

If you are working independently and not as part of the classroom phase, you are free to select another program from the list below. and to continue until you have completed it.

One of the advantages of working with programed texts is that you can work at your own speed. There is not waiting, no pressure to catch up. Texts may be obtained from your library or from your school's project coordinator, and will be furnished to you free of charge.

ENGLISH PROGRAMS

Figures of Speech, Effective Letters, Programed English, Structure of Poetry, Vocabulary for College I and II, A Programed Approach to Writing, Programed English Skills, Capitalization. Commas, Subject and Verb.

MATHEMATICS PROGRAMS

Decimals and Percents Computing Square Root
Understanding the Metric System
Understanding Problems in Arithmetic
Number Bases and Vinary Arithmetic
Logarithms Introduction to Fortran
Basic Slide Rule Operation
Introduction to Geometry
Introduction to Probability—What are the Chances?
Introduction to Equation Solving
Introduction to Structure—Modular Systems
Analytic Tirgonometry Parts I to III
Modern Algebra—A First Course
Unit I—Integers and Rational Numbers
Unit II—The Language of Algebra
Unit III—Open Sentences in Two Variables
Unit IV—Polynomials
Unit V—Rationed Expressions
Unit VI—The Real Numbers
Basic Mathematics Verbal Problems in Algebra
Bookkeeping (Beginning) Quick Calculus

SCIENCE PROGRAMS

The Chemistry of Photosynthesis Meteorlogy
Geology Unit Your Heart and Circulation
Auogadror's Numbers The Gas Laws
Naming Simple Hydrocarbons
Programed Astronomy I—The Solar System
Programed Astronomy II—The Night Sky
Biology Unit—The Evolution of Life
Programed Physics—Optics and Waves
Programed Physics—Mechanics
Vectors. A Programed Text for Introductory Physics

SOCIAL STUDY PROGRAMS

Every Four Years The Changing City
Westward Expansion of Our Nation
The Bill of Rights The Constitution
Theory of Income Determination
Supply and Demand How a Bill Becomes a Law
China Southeast Asia

OTHER PROGRAMS

Fundamentals of Music Basic Transistors
Introduction to Blueprint Reading--Five Parts
The Accounting Process
Your Car and Safe Driving
Contract Bridge for Beginners
Improving Your Chess Skills
The American Business System

"THERE'S ONE BORN EVERY MINUTE"

P. T. Barnum, famous circus entreprenneur and showman, didn't mean that a newsletter like our own "TITLE VII B NEWS NOTES" was born every minute, but according to statistics, there are almost enough newsletters in the United States at the present time to make that a true statement. This is the first issue of the "NOTES" and the project research staff hopes it will help to keep all of us in touch who are participating in a study so new to our area; the study of effects of programed learning in our high schools. We will be bringing news to you of recent studies in the field, news of your own participation and new courses which you can take, as well as news of coming events, meetings and workshops. The NEWS NOTES should help all of us to become better acquainted as we share a common interest

Those of us who live in rural northwestern Pennsylvania want our high schools to continue to grow, both in number and quality of course offerings. So much that is new and exciting is happening in our nation in the field of education. The NOTES will attempt to bring that news of national scope to you which concerns programed instruction or texts.

The research staff will be delighted to hear from you, and a letters column will be provided for publishing your views.

YOUR SCORED TESTS

Those of you who have completed tests will be receiving the corrected tests with scores within the week. Your tests have been scored at the offices of the Research Center by both the research staff and by consulting professors who have assisted the staff. While it is early to asses data, the "NEWS NOTES" is happy to report that generally, test scores were high, showing careful step by step work on the part of all participating students.

JUST IN JEST

One teacher reports that her pupils are full of the new math, the new English, and the new science, and the same old excuses. Mark Twain said once, "Always do the right thing; this will gratify some and astonish the rest."

THE BOOK CORNER

There are countless numbers of excellent books available to you if you are interested in reading further about the uses and development in the field of programed learning. Following are two staff recommendations of recent publications in the field:

PROGRAMED INSTRUCTION: A MANUAL OF PROGRAMING TECHNIQUES, by Dale M. Brethower, Educational Methods Press, Inc., Chicago, Illinois, 272 pps.

PROGRAMED LEARNING: A CRITICAL EVALUATION, edited by John L. Hughes, Educational Methods Press, Chicago, Illinois.

A publication of the Foundation for Research on Human Behavior, this manual is for the informed layman who wants to learn more about the new field of programed learning, as it brings together in a single volume both the complete reports of five outstanding research studies, and the critical appraisal of these studies by leading authorities in the field.

TEXTS IN USE NATIONALLY

According to recent figures published by the New York Times in its educational section, the sales of programed texts has zoomed from less than two percent of the national school market in 1961 to an estimated twelve percent in 1965. Publishers are finding the demand greatest especially in areas where diversified subject matter is not possible because of small staff or isolated locale. As in inexpensive supplementry learning device its uses are being discovered and put to work in all sections of the country.

In Denver, one of the earliest users of programed materials, teachers found that used as a teacher supplement, that is, used for part of the classroom time, the amount of learning was substantially raised. One of the significant findings in the Denver experience in introduced programed materials under and N.D.E.A. grant, was that it took, more time to select and to introduce than they had anticipated. The concept of programed materials is here to stay, but only time will allow for its complete acceptance by both professional personnel and students.

IT'S A FACT!

The two widely and currently used techniques in programed materials are called **linear** and **branching** programing. In linear programing, the material is arranged in a single ordered sequence and every student must proceed from the first through the last item. All of the programed texts being used by the students involved in the project employ this method.

The practice of providing the student with alternate routes while they progress through the program is called branching. More than one sequence on route through the program is arranged, and the student follows the route determined by his own answers. For example, a correct response to one question may lead down a route that skips several frams, while an incorrect reply produces a route on which each of these frames must be considered.

Some Advantages of Programed Instruction

Constant review is provided along with continual practice.

Great savings of time are possible, sometimes as high as fifty percent.

The student works individually, at his own speed, and doesn't have to wait for the class.

A greater variety of subjects and courses can be made available through programed texts.

N. D. E. A. TITLE VII-B PROJECT
Clarion State College
Clarion, Pa. 16214

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Title VII-B News Notes

Vol. I No. 2 Clarion and Slippery Rock State Colleges March, 1966

1362 TESTS COMPLETED!

Our most reliable method of determining the progress made by each student in the project is by counting the number of tests taken. A record of your completed tests is kept for each of you in our main office at Clarion State College. Each test you take is mailed to this office by your guidance counselor. The tests are scored, recorded and returned by mail to your counselor for your examination.

The NEWS NOTES is happy to announce that there have been 1362 tests taken by all the students in the project to date. They have all received individual attention and the processing has been completed as rapidly as possible. Knowing how interested you are in the results of your tests, we will be returning them to you in a short time, but with so many coming in so fast, we hope yo uwill understand if returns seem slow.

Although many of you have made rapid progress in your programed text, some of the students who volunteered to participate in the project last fall have not yet taken their first test. The project staff hopes this is only a temporary delay, and that those who have missed out on the test participation will start to work now, while there is still time. Come on in, the water's fine. Once you take the first test and receive your scored results, the other tests will seem easier to fit into your busy schedules.

All of the tests in the various programed texts are in the possession of your guidance counselor. Whenever you feel prepared to take a test in your particular text, contact him to make arrangements Most of the tests take between ten to fifteen minutes to complete. They are all objective-type tests consisting of multiple choice items, matching, completion, and true-false statements. Listed below is an indication of approximately the interval a test shouxld be taken in each text:

TEXT	NO. OF TESTS	MAT. COVERED
Genetics	23 Tests, no Final	1 after each lesson
Human Behavior	4 Tests, & Final	Except the First, every two chapters
Sets, Relations, and Functions	4 Tests, & Final	Approximately every 300 frames
Social Behavior	3 Tests, no Final	Except the First, every two chapters
Spelling Improvement	12 Tests, & Final	After every unit
Statistics	5 Tests, & Final	Approximately every 500 frames

PROJECT RECOGNITION

Itis anticipated that most of the students now involved in Project VII-B will qualify for the Certificate of Completion that will be issued by the project director at the end of this school year. This acknowledgement will certify that each participant has completed the programed text he voluntarily selected last fall. In order to qualify for this recognition which will also be endorsed by the presidents of both Clarion and Slippery Rock State Colleges, each student will be required to have completed the programed text and all accompanying tests.

QUESTIONNAIRE FOR PARENTS

Very shortly we will be asking your parents to participate in Project VII-B. They will be contacted by mail and requested to respond by completing a very brief questionnaire.

The primary purpose of making this contact with your parents is to get their opinion about this new teaching media called programed instruction. It is assumed that their familiarity with either your experiences in this project or an experience that they have had elsewhere has enabled them to develop an opinion toward programed instruction.

We are requesting that the students who are involved in this project assist in any way possible so that we may receive a prompt 100 per cent return of the parental questionnaire.

AIDS FOR LEARNING

Some of Project VII-B's participating students may have been dismayed at the large amount of repetition found in their programed texts. That repetition, known as overlearning, is one of the fundamentals of the progress, and is purposely built into the text to take the place of the drill that is received in most conventional classroom situations. You actually learn as you work, so stay with it. To make your work as meaningful as possible, the project staff would like to offer a few suggestions. If you follow them, you will be able to make more effective use of your text.

1. Don't expect to spend an equal amount of time on each frame (statement or question). Sometimes you will do a series of frames rather quickly and then come to a single frame that may take several minutes.
   DON'T RUSH. TAKE YOUR TIME.
2. The misreading of frames often results in error, so read very carefully before writing your answer.
3. When you get an answer wrong, re-read the frame. Don't go on to the next one until you understand why you were wrong. This is very important.

FUTURE USE

As you pursue your education on a higher level, you may find this programed learning experience of extreme value. You may be called upon in the future to rely heavily upon some of the experiences you are now having. With increasing enrollments, colleges and universities, must accept the requirement of teaching large numbers in large classes. This imposes many restraints and limitations on what are thought to be essential characteristics of good teaching. This has resulted in a large number of experiments dealing with the effective use of new teaching media that can successfully and simultaneously reach a large number of persons and still keep learning private and personal. A case in point was the research and development work on programed instruction conducted on the Pennsylvahia State University campus in 1961-62. They attempted to determine whether programed courses in contemporary algebra and in English grammar could be successfully adopted for presentation over closed-circuit television ond films, in combination with printed material, for programed instruction.

It seems likely that as colleges and universities search feverishly for the solution to the problems posed by the increased enrollments that in the future more of the new and tested learning and teaching techniques will be incorporated on the campuses.

CONGRATULATIONS

The Project staff is delighted to announce that twenty students have already completed an entire program, text, and texts. We would like to extend our congratulations to all of you who have approached programed instruction with such enthusiasm. By the next issue of the NEWS NOTES we hope to have many new names to add to this list, and we are looking forward to receiving **your** completed tests. If you are working independently and not as part of the classroom phase of the project, you are free to select another text for completion.

Students completing programed text and all related tests are:

NAME	SCHOOL	LOCATION	TITLE OF PROGRAM
Dennis Turner	Lakeview High School,	R.D. 1, Stoneboro, Pa.	Sets, Relations and Functions
Gary Trunk	Clarion Area High School,	Clarion, Pa.	Sets, Relations and Functions
Linda Lee Shaw	Clarion-Limestone Joint School,	Strattanville, Pa.	Sets, Relations and Functions
Tracy Clark	Lakeview High School,	R.D. 1, Stoneboro, Pa.	Social Behavior
James M. Griffin	Lakeview High School,	R.D. 1, Stoneboro, Pa.	Social Behavior
Hood Johnston	Wilmington Area High School,	New Wilmington, Pa.	Social Behavior
Linda Wellborn	Freedom Area Junior-Senior High School,	Freedom, Pa.	Social Behavior
Linda Simmons	Clarion Area High School,	Clarion, Pa.	Social Behavior
Clifford Myers	Union Joint High School,	Rimersburg, Pa.	Social Behavior
Brenda Beggs	Lakeview High School,	R.D. 1, Stoneboro, Pa.	Spelling Improvement
Susan McCurdy	Lakeview High School,	R.D. 1, Stoneboro, Pa.	Spelling Improvement
Ann Kohlmeyer	Moniteau High School,	R.D. 2, West Sunbury, Pa.	Spelling Improvement
Linda Hood	Mars Area Joint High School,	Mars, Pa.	Spelling Improvement
Shirley Bame	Seneca Valley High School,	R. D. 1, Harmony, Pa.	Spelling Improvement
Carolyn Davey	Seneca Valley High School,	R. D. 1, Harmony, Pa.	Spelling Improvement
Wes Jamison	Seneca Valley High School,	R. D. 1, Harmony, Pa.	Spelling Improvement
Diana Flick	North Clarion County Joint School,	Leeper, Pa.	Spelling Improvement
Donna Hoover	North Clarion County Joint School,	Leeper, Pa.	Spelling Improvement
Kerry Wolbert	North Clarion County Joint School,	Leeper, Pa.	Spelling Improvement
Bernice Wolbert	North Clarion County Joint School,	Leeper, Pa.	Spelling Improvement

EDUCATORS AGREE

Although there is something less than unanimous agreement on the principles involved in programed learning, here are some that educators are most apt to agree upon:

1. The subject matter is broken into small bits called frames. These frames can vary in size from one sentence to a series of small paragraphs.
2. Active participation on the part of the student is essential. He must either answer a question or fill in a blank. It is highly desirable that the student's response demonstrate an understanding of the material.
3. The student is made immediately aware of the correctness of his answer which has the advantage of quickly correcting a misunderstanding or reinforcing his response. Since programed materials are written in such way that the student's response is correct a high percentage of the time, one is apt to find a higher rate of reward or reinforcement than found on most ordinary teaching situations.
4. The programed materials are so skillfully arranged in small segments by the author that not only is the presentation improved but the student is lead to a desired outcome by rewarding him for activity that more closely approximates this goal.
5. The student is usually free to progress at his own rate. He may work through a program rapidly or slowly. It is possible for him to be completely independent of others participating in the same program. Some of the more traditional teaching situations may force every student to proceed at the same rate, which can be to fast for some and too slow for others.

PROGRAMS PLACED IN SCHOOL LIBRARIES

The task of placing a variety of programed materials in each library of the schools which are participating in Project VII-B has been completed. The reason for doing this was to give all of the students and teachers in each school an opportunity to examine and use some of the material presently available on the market. The programed texts placed in the libraries are a highly selected sample of those materials which now are being produced in the various subject fields. It is our hope that by the end of the academic year these texts will have had extensive circulation among the students and teachers.

In order to aid us in our evaluation, we are requesting that each person who borrows one of these programs fill out a brief check list.

SPECIAL TESTING PLANNED

Arrangements are in progress now with the Project Co-ordinators of all participating high schools for the administration of two test series to students working in the individual phase of the Project.

Area Research Assistants will be conducting the tests at the schools in order to determine the relationship between a student's ability and his level of achievement.

The Iowa Silent Reading Test will be given to all students working individually and the California Mental Maturity Test, which involves both language and non-language sections, will be given to all those students working individually who are new to the program.

PROGRAMED INSTRUCTION TRANSLATES SUBJECT MATTER INTO KNOWLEDGE

Programed instruction is part of a new revolutionary, instructional technology. This new horizon of learning concepts will enable our teachers, students, government society, and our nation to meet the technological and challenging problems of this changing world through better understanding and knowledge.

Programed instruction is designed for the **learner.** Since its arrival, programed instruction has caused everyone interested in the educational, training, and learning fields to look closely at what is called **teaching** and **learning.**

Programed instruction is **not** a cure-all, but rather a bonafide instructional technology of scientifically based principles that are woven into a **program** that is capable of teaching.

With the growing complexity of business, industrial and educational technologies, a vastly increasing number of personnel are required to perform under adverse conditions. Programed instruction offers a new, effective, and economical means of overcoming some of the problems of instructor shortages, inadequate or remote facilities, and other situations involving the learning process. Programed instruction offers a means of simplifying the complex and allows more effective utilization of instructor and student time.

Status: The technology of programed instruction is relatively new. Likewise, the art of programing is in a stage of growth and a period of adjustment. Early efforts have proved that in spite of the rapid progress and extensive activity, programed instruction is an effective and efficient innovation to the learning process

Our Title VII-B Project will certainly do much to increase our knowledge about how programed instruction can be used. Although speculation at this point is useless, the results we obtain should certainly be of interest to all persons concerned with education. Any success we achieve will be due to close cooperative effort of everyone involved.

WILL PROGRAMED INSRUCTION REPLACE TEACHERS?

In an age of automation, cybernetics, and chess-playing machines, one of the concerns that come to the mind of people encountering programed materials for the first time, is whether these new materials will replace the teacher in the classroom.

While the Project staff believes that programed instruction is an excellent **supplement** to learning, we think that it does not attempt to replace the human quotient in education, any more than do films, workbooks, chalkboards, or slides, all devices used by teachers to help them in their work.

WE'RE GLAD TO SEE YOU AGAIN!!

You must have liked using programed materials last year, because there are so many of you working with us again this year. If we take into account the number of participating students last year who have graduated and are no longer eligible for the program, the following percentages of students in their second year in the Project is gratifyingly high.

Students working individually who participated last year have chosen entirely new courses and programed materials to supplement their regular class work.

School	Total No. of Students Participating	Number of Students in 2nd Year	Percent of Students in 2nd Year
Allegheny-Clarion Valley	20	11	55
Brookville Area	20	8	40
Clarion Area	21	13	61
Clarion-Limestone	18	12	66.6
East Forest	20	5	25
Fairview	20	12	60
Keystone	21	14	66.7
Knoch	21	11	52.4
Laurel	20	6	30
Mars	21	10	47.6
Monteau	20	10	50
North Clarion County	20	10	50
Redbank	21	14	66.7
Seneca Valley	21	6	28.6
Slippery Rock	20	7	35
Union Area	20	4	20
Union Joint	18	8	44.4
West Forest	17	9	52.9
Wilmington	20	8	40
TOTAL	379	178	47

AUTOMATED BUSYBODY

We just heard something which hasn't to do with programed learning, but somehow fits in with the total picture of automation and the machine world.

In one of the large engineering offices in Washington, a strange new creature has appeared, possibly in honor of St. Patrick's Day. He is a machine Brainstormed by a group of government engineers, which can climb stairs, roll around among desks in a busy office, and generally makes himself a nuisance. He is known to office personnel as Cy Borg.

Silently, except for a small regular humming noise, he watches secretaries, office boys and executives. There are few places in the office which escape his silent surveillance. His inventors say he has no real purpose, but nervous secretaries think he is there to keep them off balance, and possibly more alert. He is not very popular.

Energy for his operation is no problem for Cy Borg. When his storage batteries run low, he pats his wire feeler along the base of a wall until he comes upon an electrical outlet, plugs himself in, and is soon ready to go again.

TITLE VII-B-CO-INVESTIGATORS

The responsibility to develop policies and to advise on the general direction of Project VII-B, belongs to the two educators who have been with the project since its beginning. The NEWS NOTES is happy to introduce to you, our Co-Investigators on Project VII-B, Dr. William J. Page, of Clarion State College and Dr. Nelson Hale of Slippery Rock State College.

DR. WILLIAM J. PAGE received his doctorate from Temple University and is author of a number of published research reports which include, **Enrollment Trends, (Delaware), Fiscal Responsibility of School Districts, (Delaware), and Problems of High School Principals,** (Central Fund for for Research, The Pennsylvania State University). He has participated in N.D.E.A. research projects at the Pennsylvania State University which were under the direction of Robert B. Patrick and Gerals Torkelson.

Dr. Page is the Former Director of Research and Publications, Department of Public Instruction of Deleware, and is a former member of the undergraduate and graduate faculties, of the Pennsylvania State University.

At the present time, Dr. Page is serving as Director of Student Teaching and Placement at Clarion State College.

DR. NELSON HALE, Co-Investigator of VII-B. earned his Ph.D degree at the University of Pittsburgh, where his dissertation was entitled, **A History of the Pennsylvania Population.** He has served as a classroom teacher, a High School principal, a co-operating teacher as well as having extensive experience in college teaching. He has been a member for the past four years of the State College Curriculum Commision.

At the present time, Dr. Hale is Chairman of the Secondary Division at Slippery Rock State College.

COLLEGE ENROLLMENT UP 12 PER CENT

College and university enrollments last fall rose to 5.9 million, an increase of 12 per cent over last year, according to the U. S. Office of Education.

Students working toward bachelor or higher degrees numbered 5,570,000 at 2,181 institutions. Another 397,000 students, 65,000 more than last year, are enrolled in study not leading to a degree.

Enrollments for degree credit at all levels broke all records for the 14th consecutive year, and more than doubled the 2,679,000 students enrolled 10 years ago.

Of this years total degree credit enrollment, 70 per cent, 3,937,000 are studing full time; 39 per cent of this enrollment are women.

Increases in freshman enrollments have been about 17 per cent during each of the past two years.

VII-B INTERNATIONAL

The NEWS NOTES would like to congratulate Mr. Ramakrishna Rao of India, on the successful completion of the Project's Statistics course. It is the first course in statistics for Mr. Rao, who is teaching general science and biology at the Seneca Valley High School in Harmony, Pa.

Mr. James Jamison, guidance counselor for Seneca Valley reports that Mr. Rao was one of the first secondary guidance and counseling teachers in India, and that he plans to continue that work when he returns to India in August of this year.

JUST IN JEST

One wife admitted she had a model husband—but not a working model. Cars are being built with more and more power probably because more and more pedestrians are escaping.

Thinking, said the little boy, is when your mouth stays shut and your head keeps talking to itself.

Spring fever is a kind of haziness. The rest of the year we call it laziness.

And of course, you must have heard the one about the visiting Martian, who saw a gum-ball machine in a penny arcade. "What's a good looking girl like you doing in a place like this?", he asked indignantly.

N. D. E. A. TITLE VII-B PROJECT
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Clarion, Pa. 16214

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Title VII-B News Notes

Vol. I No. 3 Clarion and Slippery Rock State Colleges July, 1966

A LETTER FROM OUR DIRECTOR

Dear High School Students,

Now that the School year has ended and you have finished your part of "Project 7", you can relax and enjoy your summer vacation—or earn some money if you have been fortunate enough to get a job. Back here at the "Project 7" headquarters, however, we are very busy analyzing the results of your work.

We were pleased at the number of students who completed one or more courses during the year. We realize you did this without school credit and you did it on your own, without someone telling you what to do and when to do it.

We were also pleased at the use made of programmed materials in the twenty selected classrooms during the second semester. The students in those classrooms used the material as a regular part of their classroom assignment.

As we study the results of these two phases of the project—the phase in which you worked independently and the phase in which the material was used in the regular classroom—we are interested in determining how the materials may be used to the greatest advantage. For example, we are wondering if it would be a good idea to have a wide selection of programmed courses from which students could choose for regular high school credit. If we did this, to what extent should the student be supervised in his study? Should this be "paced" to make sure a course is completed in a semester or should a student be allowed to take as little or as much time as he wishes?

These questions just represent a few of the basic answers we are seeking. We believe the study which is now being completed will help answer some of the questions. We may decide to try this in some selected schools for credit next year.

When we complete our anaylsis of the project a report will be filed at the U. S. Office of Education in Washington, D. C. This report will be available to any school in the nation that is interested in our recommendations.

We believe that programmed learning as a teaching technique is going to have a major impact on the schools of the future. We are happy to have had your cooperation as a participant in the project. You can be proud of the fact that you had a part in a study that is designed to demonstrate the value of these materials.

On behalf of the entire Project 7 staff, I wish to personally thank you for your participation and to thank your school administrators for their cooperation.

Sincerely yours,
John McLain, Director
Project 7

NORTH CLARION STUDENTS COMPLETE TWO PROGRAMS

Donna Hoover and Ron Orlosky, both Students from North Clarion County Joint School finished two programs each on the Title VII-B Project.

The NEWS NOTES would especially like to commend Donna and Ron for their work in completing the programs in Mathematics and Spelling. Work in Mathematics involved five tests and work in Spelling involved taking a total of 13 tests. Congratulations Donna Hoover and Ron Orlosky for a job well done.

RESEARCH ASSISTANT NAMED

The NEWS NOTES would like to welcome our new research assistant, Dr. E. W. Averill, Professor of Mathematics at Clarion State College. Dr. Averill received his A.B. from Cornell, his M.B.A. from Harvard Business School and his Ph.D. from University of Michigan. Dr. Averill was also a Wall Street statistician for 10 years, a General Motors statistician for 5 years and a Government statistician for 5 years. Later, he owned E. W. Averill and Co., Manufacturers Representatives, in Detroit. He was a professor of Statistics at Parsons College for four years before coming to Clarion, and taught junior high school mathematics for 2 years while working on his doctorate.

Dr. Averill is married and has three children, Ann, a graduate of Wittenberg College and Wayne State University, now an elementary teacher in Alaska; E. W., Jr., a graduate of Cornell, a chemical engineer with Monsanto in Los Angeles, and Jeffrey B., who enters Cornell this fall. He is a dog fancier, owns two Brittany Spaniels, one a champion, the other a C.D., and judges Sporting Dogs and Obedience Trials at dog shows all over the country, having judged in 31 states from coast to coast. He is also interested in Boy Scouts, being Training Commissioner at the Col. Drake Council in Oil City.

Dr. Averill is in Who's Who in the East, which shows that he belongs to the Am. Mathematical Society, the Am. Statistical Ass'n., the Mathematical Ass'n of Am., the Nat'l. Council of Teachers of Mathematics, the Am. Ass'n. Univ. Profs., Sons of the Am. Revolution, Chi Beta Phi, Phi Delta Kappa and Pi Kappa Alpha.

COMPLETION CERTIFICATES MAILED

A Certificate of Completion is to be mailed this month to the home of each student who has completed an entire course of study in the educational research project, "Programmed Instruction for Superior Students in Small High Schools," during the 1965-66 academic year.

The certificates, signed by Dr. John McLain, Project VII-B Director, and President James Gemmell of Clarion State College or Dr. Robert Carter, President of Slippery Rock State College, will go to 149 students this year.

The project staff would like to take this opportunity to congratulate those students receiving the certificates. In addition to their regular schoolwork, they have put forth the extra measure of interest and effort which has enabled them to complete the program.

Freedom Area Junior-Senior High School

Grace Bird
Ray Pavolvic
Bonnie Sherman
Meta Shoup
Paulette Tirpak
Linda Wellborn
Carol Zoltani
Linda Zoltani

Knoch High School

Linda Kriley
William Stumpf

Mars Area Joint High School

Linda Hood
William Marshall
Dennis McCandless
Wesley Mitchell
Donna Oblack
Paul Oblack
Jay Ryan

Mohawk Junior-Senior High School

Bonita Brydon
Stephen Feld
Donald McKim
Caroline Pence
Linda Ryan
Donald Stewart
Helen Storti

Riverside Junior-Senor High School

Gary Ripper

Seneca Valley High School

Shirley Bame
Carolyn Davey
Sally Henderson
Wes Jamison
John Kelly
Earle King
Sylvia Rapp

Shenango High School

John Zurasky

Worthington-West Franklin

Edda Koeller

Brockway Area High School

Cathy Barraclough
Judy Grimm
Vicki Harry
Sharon Koval
Phyllis Marshall
Sandy Miller
Mary Ann Prokop
Ruth Ellen Rogos
Marsha Ross
Chester Whelpley

Clarion Area High School

Bette Jo Kroh
Sue Lawrence
Linda Peterson
Chuck Sardi
Linda Simmons
Gary Trunk
Tom Wein
Gary Wolbert

Clarion-Limestone Joint School

Linda Lee Shaw
Karl Slater
Barbara Vogel

East Forest Joint School

Mike Adams
Linda Covel
Mary Covert
Helen Fiscus
Tom Glenn
Marlene Leichenberger
Bonnie Mensch
Gayle Motter
Amy Nesbella
Mike Pastilock
Pat Pastilock
Marjorie Reynolds
Kathy Riggs
Nikki Ruhlman
Mary Beth Russell
Diane Shields
Carol Wallace
Lois Zimmerman
Muriel Zimmerman

Keystone Joint High School

Jeanne Cramer
Melanie Shingledecker
William Austin
Gretchen Flath

North Clarion County Joint School

Diana Flick
Donna Hoover
Sylvia Moore
Ron Orlosky
Bernice Wolbert
Kerry Wolbert

Lakeview High School

Eugene Adamson
Brenda Beggs
Christine Boodley
Tracy Clark
Rachel Carnahan
Tim Carpenter
Mary Gander
Anita Genger
James M. Griffin
Dianna Henderson
Christine Martin
Susan McCurdy
Lee Partridge
Mary Slater
Dale Stoops
Dennis Turner

Redbank Valley High School

Susan Packard

Tidioute Junior-Senior High School

Fritz Anderson
Chuck Barton
Kathy Benner
Linda Campbell
Janice McGraw
Carl Pillar
Edward Ziegler

Union Joint High School

Clifford Myers
Ann Traister

Mercer High School

James Sharpless
Karen Snyder
Gregory Zahuranec

Slippery Rock Area Joint High School

Karen Allen
Debby Duncan
Thomas Fleeger
Karen McCandless
Carolyn McDowell
Karen Mershimer

Fairview Twp., Karns City High School

Patricia Barnhart
Peggy Burns
Pete Schidemantle
Sandra Stevenson

Moniteau High School

Alice Boosel
Linda Confer
Bonnie Conn
Bonnie Deal
Monalee Hillard
Sally Hillard
Darlene Hutchison
Ann Kohlmeyer
David Smith
Lana Tiche

Allegheny-Clarion Valley Joint School

Nancy Dunlap
Diane Sheakley
Shirley Stephens

Nesannock High School

Wendy Fox
Anthony Vallillo

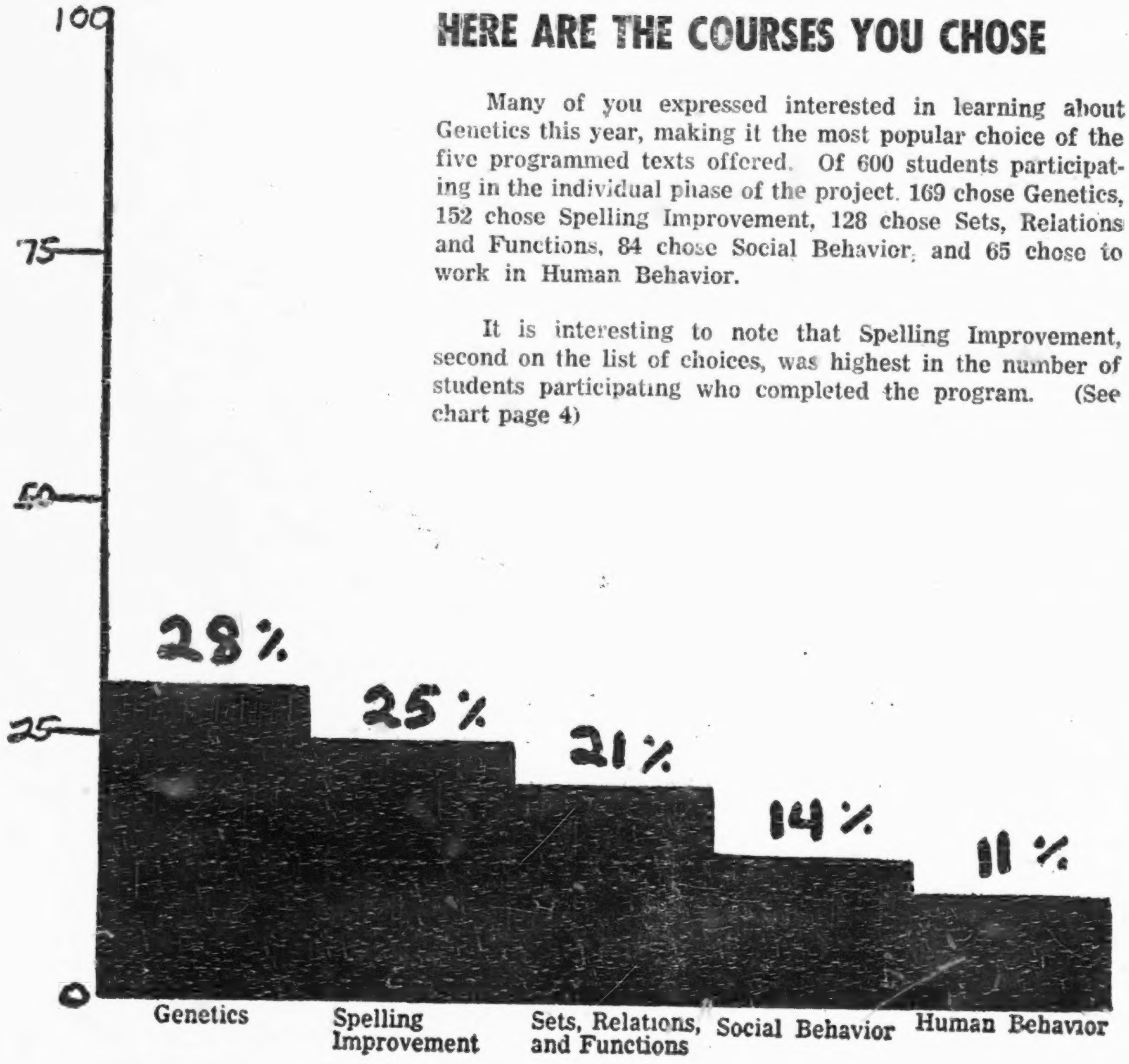
Wilmington Area High School

John Galbreath
Shelley Genger
Hood Johnston
Richard McKee
Chris Miller
Carolyn Nesik
Kathy Offutt
Don Pratt
Fred Schroeder

HERE ARE THE COURSES YOU CHOSE

Many of you expressed interested in learning about Genetics this year, making it the most popular choice of the five programmed texts offered. Of 600 students participating in the individual phase of the project. 169 chose Genetics, 152 chose Spelling Improvement, 128 chose Sets, Relations and Functions, 84 chose Social Behavior, and 65 chose to work in Human Behavior.

It is interesting to note that Spelling Improvement, second on the list of choices, was highest in the number of students participating who completed the program. (See chart page 4)



STUDENTS COMMENT ON PROGRAMS

Our three research assistants have collected comments on the programmed materials from all of the students working in the Individual phase of the Program. Most students found the texts helpful and challenging, but some had other comments. NEWS NOTES would like to reprint for you some of the more frequent and interesting comments students made:

"If a student doesn't understand something, there's no one to explain it."

"Programmed learning lets me work at my own speed and see right away where my mistakes are."

"The main advantage is that I am able to study subjects that are not in our school's curriculum."

"This has given me a chance to explore a field which fascinates me."

"The one thing I miss is classroom discussion of the material."

"Since the program is based on personal initiative, you may be tempted to put it off."

"I must use my own initiative. The program helps me to take responsibility and to learn for myself instead of being pressured. It has taught me some self discipline."

"The program has given me an idea of what it is like to study and learn on my own."

By far the most frequent comment by students was that they liked being able to work at their own rate of speed. If they were slow, the programmed text relieved pressures, and if the students were fast, slower students did not hold them back.

TEACHERS EVALUATE PROGRAMMED TEXT

Teachers in the classroom phase of the Project were asked to give their reactions to the use of programmed texts. In a series of anecdotal reports, teachers gave professional insights into the uses of the material. The reports will be part of a final evaluation report to the government on the results of the VII-B Project.

Teachers varied on their use of the texts, some using it as the entire instructional program and others using it as a supplement to regular class work.

The time schedule varied as well, from the use of the text once a week for five weeks to its regular use on set days twice a week. Some teachers preferred to assume an active role in guiding students and in urging them to complete programs within set time limits, and others preferred to adopt a more passive role, placing the responsibility for completion and time management upon the students themselves.

When asked about the possibility of continuing a course in programmed learning for credit at their school, the teachers gave a generally favorable reaction, as it was felt that the programmed text offered itself as an organized supplement to regular classroom material.

Colleagues in many of the schools reporting, expressed an interest in the program and one teacher reports that when a book became available because of a student's leaving school, her fellow teacher borrowed the book and completed the course himself.

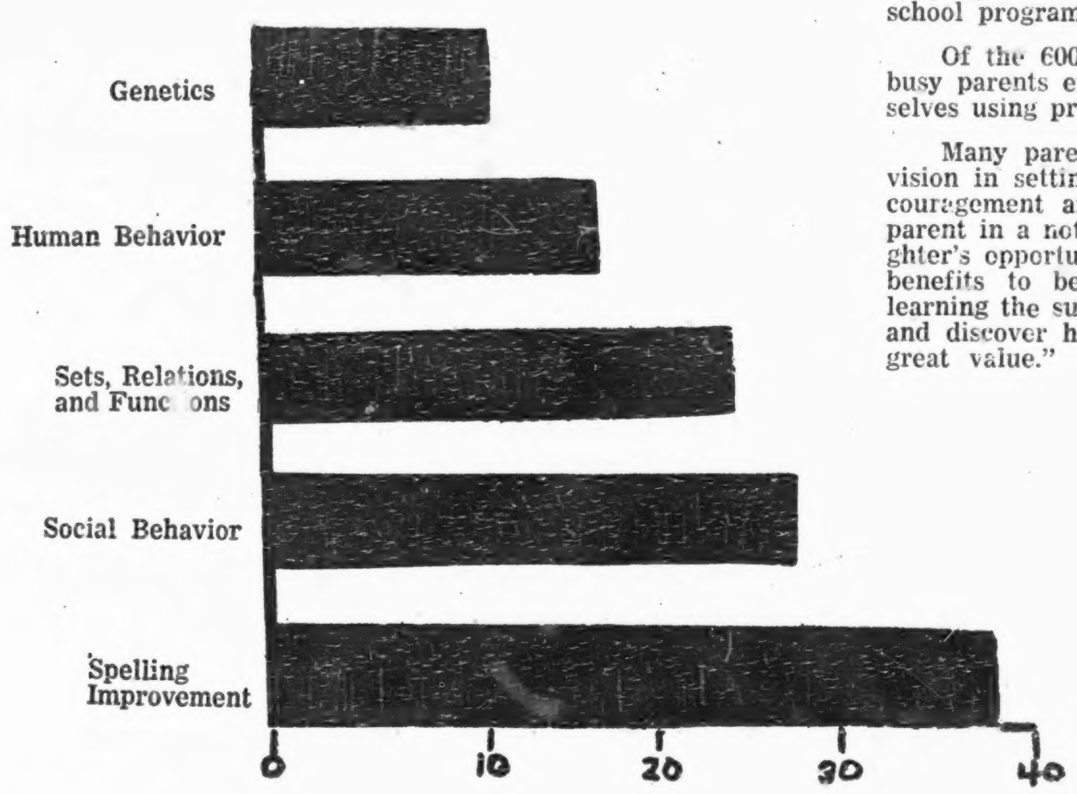
COMPUTER TO BE USED

Dr. George Lewis, Director of the Computer Center at Clarion State College will work with Dr. Averill to compile statistical analysis on the information collected by the project research assistants for evaluation. Data from the three tests administered to students and teachers will be processed this summer on the IBM 1620, housed at the college.

The Iowa Silent Reading Test and the California Mental Maturity Test were administered to students. The Ozgood Semantic Differential Test was administered to teachers in the classroom phase of the project before and after their work with the programmed materials in order to determine if familiarity with use changed attitudes in regard to programmed learning and materials.

Competed Programs Earn Certificates

Of the students who chose to participate on an individual basis in one of the five programs offered, the highest percentage completed the program in Spelling Improvement. A certificate of completion was mailed to each of the students represented as part of the percentage of this graph.



DR. BERTY ACCEPTS NEW APPOINTMENT

Dr. Ernest Berty, who has been working with the Project staff as a Research Assistant in Area B, has left the Project on May 31, 1966, to accept a position as Director of Research at West Virginia University in Morgantown, West Virginia.

Dr. Berty has worked closely in all phases of testing and research with programmed learning in Freedom, Knoch, Mars, Mohawk, Riverside, Seneca Valley, Shenango, West Beaver, and Worthington High Schools. The research staff and the NEWS NOTES would like to join in wishing Dr. Berty success and happiness in his new post.

Parents Respond

As part of the anecdotal data of the VII-B Project, this research staff mailed questionnaires to the parents of every student in the individual phase of the program. Information from the questionnaire has been returned to the research office and the results have shown that a majority of the parents are enthusiastic about the use of programmed texts as a supplement to the regular school program.

Of the 600 parents receiving the questionnaire, 203 busy parents expressed a desire to take a course themselves using programmed materials.

Many parents expressed a need for teacher supervision in setting time goals for completion and for encouragement and explanation when necessary, but one parent in a note thanking the project staff for her daughter's opportunity to participate said, "I fell there are benefits to be derived from this course other than learning the subject chosen. Just to learn on your own, and discover how to study on your own, will prove of great value."

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APPENDIX K

QUESTIONNAIRE FOR PARENTS

1. When did you first hear about Programed Learning?
_____Before this project began
_____As a result of this project
_____Other (please specify)_____________________________

2. Do you think that your child has gained valuable knowledge from the Programed Learning experience he has been having?
_____Yes
_____No
_____Don't know

3. Do you like the idea of your child being able to advance at his own speed in this Programed Learning project?
_____Yes
_____No
_____No opinion

4. Would your child have advanced more rapidly with more teacher-advice and direction?
_____Yes
_____No
_____No opinion

5. Do you think that your child can learn as much from a Programed Text as from a regular class in school?
_____Yes
_____No
_____No opinion

6. Has the time spent on this Programed Learning course interfered with your child's regular activities -- school or personal?
_____Yes
_____No
_____No opinion

7. Do you think that programs in additional subjects under Programed Learning would be of benefit to your child?
_____Yes
_____No
_____No opinion

8. Would you like to take a Programed Learning course yourself in some subject in which you are interested?
_____Yes
_____No
_____Don't know

APPENDIX L

SUMMARY OF ANALYSIS OF VARIANCE FOR PARENTS' QUESTIONNAIRE

Summary of Analysis of Variance and Bartlett's Test for the parents who heard about programed instruction as a result of the project and for those that knew about programed instruction before the project. (Parents who did not sign their names.)*

TABLE L-1.--Summary of responses to question two: Do you think that your child has gained valuable knowledge from the programed learning experience he has been having?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.01	2	.01	.09	.92
Within Cells	20.50	319	.06		
Total	20.51	321			
Bartlett's Test = .92 Probability of Chi Square with 2 D.F. = .63					

TABLE L-2.--Summary of responses to question three: Do you like the idea of your child being able to advance at his own speed in this programed learning project?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.05	2	.02	.42	.65
Within Cells	17.99	338	.05		
Total	18.04	340			
Bartlett's Test = 24.63 Probability of Chi Square with 2 D.F. = .01					

TABLE L-3.--Summary of responses to question four: Would your child have advanced more rapidly with more teacher advice and direction?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.14	2	.07	.39	.68
Within Cells	53.24	292	.18		
Total	53.38	294			
Bartlett's Test = .38 Probability of Chi Square with 2 D.F. = .82					

TABLE L-4.--Summary of responses to question five: Do you think that your child can learn as much from a programed text as from a regular class in school?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.59	2	.29	1.19	.30
Within Cells	78.59	319	.25		
Total	79.17	321			
Bartlett's Test = .06 Probability of Chi Square with 2 D.F. = .97					

TABLE L-5.--Summary of responses to question six: Has the time spent on this programed learning course interfered with your child's regular activities -- school or personal?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.10	2	.05	.40	.67
Within Cells	44.28	346	.13		
Total	44.38	348			
Bartlett's Test = 1.08 Probability of Chi Square with 2 D.F. = .58					

TABLE L-6.--Summary of responses to question seven: Do you think that programs in additional subjects under programed learning would be of benefit to your child?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.07	2	.04	.48	.61
Within Cells	23.77	317	.07		
Total	23.84	319			
Bartlett's Test = 12.12 Probability of Chi Square with 2 D.F. = .01					

TABLE L-7.--Summary of responses to question eight: Would you like to take a programed learning course yourself in some subject in which you are interested?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	2.42	2	1.21	5.87	.01
Within Cells	59.63	290	.21		
Total	62.05	292			
Bartlett's Test = 16.18 Probability of Chi Square with 2 D.F. = .01					

*Each analysis of variance was accomplished with a different "N" size. Only the yes-no responses for each question were analyzed. The no opinion responses for each variable were deleted prior to the analysis.

Summary of Analysis of Variance and Bartlett's Test for the parents who heard about programed instruction as a result of the project and for those who heard about programed instruction before the project. (Parents who signed compared with parents who did not sign.)*

TABLE L-8.--Summary of responses to question two: Do you think that your child has gained valuable knowledge from the programed learning experience he has been having?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.12	4	.03	.52	.72
Within Cells	20.50	350	.05		
Total	20.62	354			
Cell Variance = 0					

TABLE L-9.--Summary of responses to question three: Do you like the idea of your child being able to advance at his own speed in this programed learning project?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.13	4	.03	.62	.65
Within Cells	19.82	370	.05		
Total	19.95	374			
Cell Variance = 0					

TABLE L-10.--Summary of responses to question four: Would your child have advanced more rapidly with more teacher advice and direction?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	1.18	4	.30	1.58	.18
Within Cells	60.53	321	.19		
Total	61.71	325			
Bartlett's Test = 1.89 Probability of Chi Square with 4 D.F. = .76					

TABLE L-11.--Summary of responses to question five: Do you think that your child can learn as much from a programed text as from a regular class in school?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.67	4	.17	.64	.63
Within Cells	89.87	348	.26		
Total	90.54	352			
Bartlett's Test = 3.92 Probability of Chi Square with 4 D.F. = .42					

TABLE L-12.--Summary of responses to question six: Has the time spent on this programed learning course interfered with your child's regular activities -- school or personal?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.41	4	.10	.84	.50
Within Cells	46.11	379	.12		
Total	46.52	383			
Cell Variance = 0					

TABLE L-13.--Summary of responses to question seven: Do you think that programs in additional subjects under programed learning would be of benefit to your child?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.15	4	.04	.51	.73
Within Cells	25.62	351	.07		
Total	25.77	355			
Cell Variance = 0					

TABLE L-14.--Summary of responses to question eight: Would you like to take a programed learning course yourself in some subject in which you are interested?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	1.50	4	.37	1.88	.11
Within Cells	63.06	317	.20		
Total	64.56	321			
Bartlett's Test = 18.59 Probability of Chi Square with 4 D.F. = .01					

*Each analysis of variance was accomplished with a different "N" size. Only yes-no responses for each question were analyzed. The no opinion responses for each variable were deleted prior to the analysis.

Summary of Analysis of Variance and Bartlett's Test for questions (3-5) for the parents who heard about programed instruction as a result of the project and for those who knew about programed instruction before the project. (Parents who signed their names) *

TABLE L-15.--Summary of responses to question three: Do you like the idea of your child being able to advance at his own speed in this programed learning project?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.06	1	.06	1.13	.30
Within Cells	1.83	32	.06		
Total	1.89	33			
Cell Variance = 0					

TABLE L-16.--Summary of responses to question four: Would your child have advanced more rapidly with more teacher advice and direction?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.08	1	.08	.31	.58
Within Cells	7.29	29	.25		
Total	7.37	30			
Barlett's Test = .05 Probability of Chi Square with 1 D.F. = .82					

TABLE L-17.--Summary of responses to question five: Do you think that your child can learn as much from a programed text as from a regular class in school?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.08	1	.08	.20	.66
Within Cells	11.28	29	.39		
Total	11.36	30			
Bartlett's Test = .74 Probability of Chi Square with 1 D.F. = .39					

TABLE L-18.--Summary of responses to question six: Has the time spent on this programed learning course interfered with your child's regular activities -- school or personal?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.06	1	.06	1.08	.31
Within Cells	1.83	33	.06		
Total	1.89	34			
Cell Variance = 0					

TABLE L-19.--Summary of responses to question seven: Do you think that programs in additional subjects under programed learning would be of benefit to your child?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.06	1	.06	1.02	.32
Within Cells	1.84	34	.05		
Total	1.90	35			
Cell Variance = 0					

TABLE L-20.--Summary of responses to question eight: Would you like to take a programed learning course in some subject in which you are interested?

Source	Sum of Squares	D.F.	Mean Square	F	F Probability
Columns	.01	1	.01	.07	.79
Within Cells	3.43	27	.13		
Total	3.44	28			
Bartlett's Test = .09 Probability of Chi Square with 1 D.F. = .76					

*Each analysis of variance was accomplished with a different "N" size. Only yes-no responses for each question were analyzed. The no opinion responses for each variable were deleted prior to the analysis.

TABLE L-21.--Summary of analysis of variance and Bartlett's Test for parents who signed and did not sign the questionnaire; and who heard about programed instruction as a result of the project and for those who heard about programed instruction before the project.

Question	Bartlett's Test	Probability of Chi Square	Analysis of Variance Computed F	F Probability
2. Do you think that your child has gained valuable knowledge from the programed learning experience he has been having?	Cell variance equals "0"	---	.52	.72
3. Do you like the idea of your child being able to advance at his own speed in this programed learning project?	Cell variance equals "0"	---	.62	.65
4. Would your child have advanced more rapidly with more teacher advice and direction?	1.89	.76	1.58	.18
5. Do you think that your child can learn as much from a programed text as from a regular class in school?	3.92	.42	.64	.63
6. Has the time spent on this programed learning course interfered with your child's regular activities -- school or personal?	Cell variance equals "0"	---	.84	.50
7. Do you think that programs in additional subjects under programed learning would be of benefit to your child?	Cell variance equals "0"	---	.51	.73
8. Would you like to take a programed learning course yourself in some subject in which you are interested?	18.59	.01	1.88	.11

APPENDIX M

ANECDOTAL RECORD MAINTAINED BY THE RESEARCH ASSISTANTS ON ADMINISTRATORS FOR PHASE I

In general, cooperation of school administrators throughout the school year was excellent, they were highly interested in any benefits their students would receive by participating in the project. Initially, they indicated some apprehension concerning any unfavorable comparisons of students from any one school with students from another school, but as the purpose of the project became more clear to them and as their own interest became aroused, this apprehension disappeared. This project enabled school administrators to become more familiar with programed materials and their usefulness in the learning process. Following are a few examples of administrative responses that were gathered by the research assistants.

The principal of each school in the project was asked to select a member of his staff who would act as a liason person throughout the project; this person would administer tests, furnish student information, answer correspondence, etc. However, there was one principal who refused to cooperate on this matter. His reason for this was that he thought the work load of his staff was heavy enough and that anyone selected for this extra responsibility should be paid accordingly. Test administration in this school was eventually handled by the principal's secretary.

In a conversation with one supervising principal he stated that his school wasn't interested in a summer program, but that he would like to see the program extended into the junior high school.

During the course of the project, the interest of one principal became so keenly aroused that he would like to offer programed instruction to his students on an elective basis. In this school the students would have a variety of programs from which to make a selection. Work on the programs would be done in a scheduled period during the school day under teacher supervision.

Some school principals have expressed concern over their students' lack of progress, and planned to have their guidance counselors meet with the students.

It was found that one school had identified only twelve students for selection as possible participants in the project. They were fearful because of possible comparisons with students from other schools; because of this they selected or submitted the names of only their very best, academically talented students.

It was also learned that part of the instructions were ignored at one school and that students had already been contacted and informed of their possible selection as participants in our project. They had been told by the school authorities and were instructed to go home and discuss it with their parents. The school administrators later agreed to expand their possible list of participants when they were reminded that the project staff would make the final selection of students.

One high school principal decided that he would serve as the liason person in his school. This is a very small high school, 363 students grades 7-12, and the principal also serves as guidance counselor. He based his decision on the fact that all of his teachers had full schedules.

There were several requests for permission to include students from grades other than 10, 11 and 12.

One particular example of this type of behavior occurred when one administrator requested the inclusion of some 9th grade students. He was informed that he would have an extra copy of the program to be used in his office and that there was nothing wrong with his working with these students on his own if he so desired; his findings with these students would not be included in the project report.

There were several administrators who wanted to include students of average ability in this type of project. They expressed concern over the amount of time available to the superior students because of his heavy academic load and his involvement in co-curricular activities. They felt that the average students had more time for extra class work.

One administrator spoke of his own son as an example of the time factor involved. He said he would think twice about permitting his son to take part in a project such as ours. He said the boy only had two study halls a week and played football and basketball. He had to start his studies as soon as he finished his supper and then it is time for bed. He said he thought a youngster needed some time for relaxation.

Members of the project staff honored several requests during the school year to attend inservice meetings at a number of project schools and discuss the project.

One liason person, worried that students would come to him with questions on statistics which he could not answer, wanted to know if he could refer students to the math teachers with their question. He called the mathematics teachers together and explained his situation. They assured him of their cooperation on the matter.

The area of student dropouts caused one principal to express concern that this might start a trend that others might follow. He wanted someone on the project staff to talk to his potential dropouts. He was told that no one would be forced to remain in the program who did not want to do so. It was explained to him that this was a demonstration project and we were only observing what would happen when these superior students in small rural high schools were given these programed materials. If any student wished to drop out of the project, this was a part of student behavior that was under study.

Varied reasons were given by those students who did drop from the project. Among the most common or predominant reasons were the lack of time or motivation of the students. All of the dropouts for example, from one project school were students who were taking one and most of them two advanced placement courses. They expressed the thought that the credit they were earning, in these courses, was the determining factor in budgeting their time in that direction and not in the project material.

The time factor brought on one particular administrative reaction when the liason person in one school worried over his students' lack of progress. Not one of the project students in his school had taken a test. He called them all together and told them to be ready to take their final test the next day. This caused many of the students to consider dropping out of the project. This condition was elieted when the research assistant assured them that this wouldn't happen again.

Participation in the project caused one principal to reflect upon various aspects of his own school program. Some of the points he discussed were:

Are our superior students really superior?

Are we grading too easy?

Are our students with ability being challenged?

Do we have enough supervision?

Another principal, in one of the project schools, is exploring the possibility of using programed materials as a supplement to his regular class schedule. His school is in the "very small" category, 122 students in grades 10, 11 and 12. Working with these small numbers doesn't lend itself to group. In a school of this type there is only one senior English class and students are in a heterogenous group. As a direct result of their participation in the project, the administration has become interested in the possible use of programed materials both as an enrichment and as a remedial function within the framework of the regular class schedule. The project staff gave them a number of programs for examination. Reference was made to the United States Department of Health, Education and Welfare Office of Education Publication, Programs '63, as an up-to-date guide to programed instructional materials available to educators.

During the course of the project year, there were several administrators that expressed an interest in the possible use of program materials as a basis for summer school instruction. The project also stimulated the use of programed materials in the instruction of homebound pupils in two of the cooperating high schools.

APPENDIX N

PRINCIPAL'S QUESTIONNAIRE

A. If programed materials were used for high school credit courses as a means of expanding curriculum offerings, which of the following would be most appropriate?

1. Which students should be allowed to participate?
    - a. Grade level ________
    - b. Ability range:
        - High ________
        - Average ________
        - Low ________
        - All ________
2. What courses?
    - a. Elective only, standard classes ________
    - b. Wide range of enrichment courses ________
    - c. Required courses ________
3. Class Procedures:
    - a. Independent study by self ________
    - b. Independent study under teacher direction on scheduled interval ________
    - c. Under teacher direction with teacher determining assignment ________
4. Who should supervise students:
    - a. Teacher specialized in particular discipline ________
    - b. General supervisior with specialized teachers available for consultation ________
    - c. General supervisor only ________

B. Future use of programed materials

1. Would you favor the use of programed material for credit? _____

    a. Selected subject areas only

    b. Any subject area if appropriate materials are available _____

    c. Not at all _____

2. Would you be interested in having your school participate in a project next year in which students would receive credit? _____

APPENDIX O

SUMMARY OF PRINCIPAL'S RESPONSE TO THE QUESTIONNAIRE

(N=28)

Question:

A. If programed materials were used for high school credit courses as a means of expanding curriculum offerings, which of the following would be most appropriate?

Which students should be allowed to participate?

TABLE O-1.--Grade level

Grade	Appropriate		Inappropriate	
	N.	%	N.	%
Seven	3	11	25	89
Eight	3	11	25	89
Nine	8	29	20	71
Ten	27	96	1	4
Eleven	26	93	2	7
Twelve	22	79	6	21

TABLE O-2.--Ability range

	Appropriate		Inappropriate	
	N.	%	N.	%
High	17	61	11	39
Average	10	36	18	64
Low	2	7	26	93
All	9	32	19	68

If programed materials were used for high school credit courses as a means of expanding curriculum offerings, which of the following types of courses would be most appropriated?

TABLE O-3.--Courses

Course	Most Appropriate		Inappropriate	
	N.	%	N.	%
Elective Only Standard	4	14	24	86
Wide Range of Enrichment	24	86	4	14
Required	2	7	26	93

TABLE O-4.--Class procedures

Class Procedures	Most Appropriate		Inappropriate	
	N.	%	N.	%
Independent Study	3	11	25	89
Independent Study with Teacher Direction on Scheduled Interval	19	68	9	32
Under Teacher Direction with Teacher Determination Association	9	32	19	68

TABLE O-5.--Who should supervise students?

Supervision	Most Appropriate		Inappropriate	
	N.	%	N.	%
Teacher Specialized in Particular Discipline	4	14	24	86
General Supervision with Special Teachers Available for Consultance	21	75	7	25
General Supervision Only	3	11	25	89

Future Use of Programed Materials

TABLE O-6.--Would you favor the use of programed material for credit?

	Favor		Not Favor	
	N.	%	N.	%
Selected Subject Areas Only	14	50	14	50
Any Subject Area if Appropriate Programs are Available	12	43	16	57
Not at all	2	7	26	93

TABLE O-7.--Would you be interested in having your school participate in a project next year in which your students would receive credit?

Yes		No	
N.	%	N.	%
24	86	4	14

*The total number of principals surveyed was 30. Two principals did not complete a questionnaire and it may be concluded that six out of 30 (20%) would not be interested.

APPENDIX P

PROGRAMED LEARNING MATERIALS LIBRARY INFORMATION

NAME OF SCHOOL ____

NAME OF TEXT ____

Borrowed by: (Check one)

_____ Student _____ Teacher Other (please specify) __________

Length of time text was borrowed:

_____ Less than a week _____ One week _____ Two weeks

_____ Other (please specify) ____________________

Use of text:

_____ Browsed _____ Partially completed _____ Completed

Purpose of borrowing text:

_____ School assignment (student)

_____ Classroom use (teacher)

_____ Examine content

_____ Personal interest

_____ Other (please specify) ____________________

____

Extent to which purpose was fulfilled:

_____ Completely _____ Partially _____ Not at all

_____ Other (please specify) ____________________

____

For what use would you recommend this programed text?

_____ Appropriate for classroom use

_____ Appropriate for supplementary material

_____ Appropriate for study outside regular classroom

_____ Other (please specify) ____________________

____

APPENDIX Q

PROGRAMED MATERIALS USED IN THE CLASSROOM

Area A

Subject	Program
English, Grade 11	Vocabulary for College I
Math (Algebra II), Grade 10	Verbal Problems, Part II
Problems of Democracy, Grade 12	How a Bill Becomes a Law
Reading, Grade 8	Vocabulary Growth
Reading, Grade 8	David Discovers the Dictionary
Reading, Grade 8	How to Research and Write a Report
Reading, Grade 8	How to Improve Your Reading
Chemistry, Grade 11	Avagadros Number
Chemistry, Grade 11	Naming Simple Hydrocarbons
Chemistry, Grade 11	Naming Inorganic Compounds
Chemistry, Grade 11	The Gas Laws
English, Grade 10	A Programmed Approach to Writing (Book II) (10 copies of "Vocabulary for College II")
Social Studies, Grade 9	The Constitution

Area B

Subject	Program
Civics, Grade 9	The Bill of Rights
Civics, Grade 9	The Constitution
Sociology and Government, Grade 12	The Changing City
Sociology and Government, Grade 12	The Constitution
Sociology and Government, Grade 12	How a Bill Becomes a Law
Sociology and Government, Grade 12	Every Four Years
Sociology and Government, Grade 12	Social Behavior
English, Grade 11	Vocabulary for College I
English, Grade 10	A Programmed Approach to Writing, Book I

Area C

Subject	Program
Mathematics, Grade 9	Basic Mathematics, Fractions and Mixed Numbers
English, Grade 11	Vocabulary for College I
English, Grade 12	Vocabulary for College I
English, Grade 11	English, 3200
Algebra I, Grade 9	First Year Algebra
English, Grade 12	Vocabulary for College I
Algebra II, Grade 11	Second Year Algebra
Mathematics, Grade 9	Basic Mathematics
English, Grade 12	Vocabulary for College I

APPENDIX R

PROGRAMED MATERIALS PLACED IN THE LIBRARY

Decimals and Percents
Understanding the Metric System
Every Four Years
The Chemistry of Photosynthesis
Programmed Introduction to Physics, Vectors
Figures of Speech
Understanding Problems in Arithmetic
Number Bases and Binary Arithmetic
Your Heart and Circulation
Westward Expansion of Our Nation
The Bill of Rights
Effective Writing
Structure of Poetry
Analytic Trigonometry (Parts I, II, III)
Modern Algebra (Units I, II, III, IV, V and VI)
Basic Mathematics (5 Vols.)
Verbal Problems in Algebra (2 Vols.)
Modern Math For the Junior High School (5 Vols.)
Bookkeeping (Beginning)
Geology Unit
Chemistry
Biology Unit
Meterology Unit
The Human Body and Its Functions
Contract Bridge for Beginners
Improving Your Chess Skills
The American Business System
A Programmed Approach to Writing, Book II
The Constitution
The Changing City
Computing Square Root
Avogardo's Numbers
Vocabulary for College I
Vocabulary for College II
Logarithms
The Gas Laws
Naming Simple Hydrocarbons
Naming Inorganic Compounds
Programmed English Skills
    a. Capitalization
    b. Commas
    c. Agreement of Subject and Verb

PROGRAMED MATERIALS PLACED IN THE LIBRARY
(Continued)

China
Southeast Asia
Programmed English
Introduction to Geometry - Points, Lines and Planes
Introduction to Probability - What are the Chances
Introduction to Equation Solving Number Sentences
Introduction to Structure - Modular
Theory of Income Determination
Supply and Demand
How a Bill Becomes a Law
Your Car and Safe Driving
Introduction to Fortran
Basic Slide Rule Operation
Programmed Astronomy I - The Solar System
Programmed Astronomy II - The Night Sky
Fundamentals of Music
Basic Electronics
Introduction to Blueprint Reading (5)
The Accounting Process
Quick Calculus
Programmed Physics - Optics and Waves
Programmed Physics - Mechanics

APPENDIX S

SUMMARY OF RESPONSES TO THE PROGRAMED LEARNING MATERIALS INFORMATION SHEET

TABLE S-1.--Summary of length of time text was borrowed by student and teacher

Length of Time Text was Borrowed	Student		Teacher		Total	
	N.	%	N.	%	N.	%
Less than a Week	45	31	45	52	90	39
One Week	21	15	14	17	35	15
Two Weeks	62	43	16	20	78	34
Three Weeks	4	3	5	6	9	4
One Month	2	1	1	1	3	2
More than One Month	11	7	3	4	14	6
TOTAL	145	100	84	100	*229	100

*The total sample that completed the Programed Learning Materials Library Information Sheet was 231. Two of the respondents were principals. They were not included in this analysis.

SUMMARY OF RESPONSES TO THE PROGRAMED LEARNING MATERIALS INFORMATION SHEET

TABLE S-2.--Summary of use of text by student and teacher.

Use of Text	Student		Teacher		Total	
	N.	%	N.	%	N.	%
Browsed	41	28	49	58	90	40
Partially Completed	59	41	20	24	79	34
Completed	45	31	15	17	60	26
TOTAL	145	100	84	100	229	100

TABLE S-3.--Summary of general purpose of borrowing text by student and teacher

General Purpose for Borrowing Text	Student		Teacher		Total	
	N.	%	N.	%	N.	%
School Assignment	140	95	65	77	209	90
Classroom Use	5	5	19	23	24	10
TOTAL	145	100	84	100	233	100

SUMMARY OF RESPONSES TO THE PROGRAMED LEARNING MATERIALS INFORMATION SHEET

TABLE S-4.--Summary of the Recommended use of Programed Text by Student and Teacher

Recommended Use of the Programed Text	Student		Teacher		Total	
	N.	%	N.	%	N.	%
Appropriate for Classroom Use	40	28	25	30	65	28
Appropriate for Supplementary Material	43	29	31	37	74	33
Appropriate for Study Outside Regular Classroom	58	40	20	24	78	34
Other (Not sure)	4	3	8	9	12	5
TOTAL	145	100	84	100	*229	100

* The total sample that completed the Programed Learning Material Library Information Sheet was 231. Two of the respondents were principals. They were not included in this analysis.

SUMMARY OF RESPONSES TO THE PROGRAMED LEARNING MATERIALS INFORMATION SHEET

TABLE S- 5.--Summary of specific purpose for borrowing text by student and teacher

Specific Purpose for Borrowing Text	Student		Teacher		Total	
	N.	%	N.	%	N.	%
Examine Content	20	14	59	70	79	34
Personal Interest	116	80	25	30	141	62
Other	9	6	0	0	9	4
TOTAL	145	100	84	100	229	100

TABLE S-6.--Summary of extent purpose was fulfilled by student and teacher

Extent Purpose was Fulfilled	Student		Teacher		Total	
	N.	%	N.	%	N.	%
Completely	11	7	7	8	18	8
Partially	52	36	46	55	98	43
Not at All	70	48	26	31	96	42
Other*	12	9	5	6	17	7
TOTAL	145	100	84	100	229	100

* The total sample that completed the Programed Learning Materials Library Information Sheet was 231. Two of the respondents were principals. They were not included in this analysis.

APPENDIX T

PARTICIPATING SCHOOLS, THEIR CHIEF SCHOOL ADMINISTRATORS, HIGH SCHOOL PRINCIPALS, THE SCHOOLS' PROJECT COORDINATORS AND RESEARCH ASSISTANTS

AREA A

Dr. Lloyd B. Johnston, Research Assistant

School	Chief School Administrator	Principal	Project Coordinator
Allegheny-Clarion Valley School Foxburg, Pa.	Budd B. Stewart	Chalmer Kenemuth	Gary Hamil
Slippery Rock Area High School Kiester Road, Slippery Rock, Pa.	Neil Williams	Charles W. Bentel	Larry C. Mickey
Moniteau High School R. D. #2, West Sunbury, Pa.	Foster McCarvey	Robert Harnett	Marion West
Fairview Twp., Karns City High School, Karns City, Pa.	Joseph McClymonds	Charles E. Hillard	Calvin L. Stevens
Laurel High School R. D. #4, New Castle, Pa.	Alfred F. Barnes	Eugene V. Hill	Samuel K. Weinschenk
Union Area High School 2106 Camden, Ave., New Castle, Pa.	Wendell E. McColgin	Arthur Zarone	Jack Boggs
Neshannock High School 301 Mitchell Road, New Castle, Pa.	Thomas P. Smathers	Vern W. Alderson	Norman R. Seaholm
Mercer High School Mercer, Pa.	Seth Gustin	Matthew Rausch	O. A. Porter
Lakeview High School R. D. #1, Stoneboro, Pa.	LeRoy Nutt	W. S. Herman, Jr.	Floyd L. Tingley
Wilmington Area High School 50 Wood Street New Wilmington, Pa.	Hugh Sherwood	David C. Lewis	Lola Christy

AREA B

Dr. Ernest Berty, Research Assistant

School	Chief School Administrator	Principal	Project Coordinator
Worthington-West Franklin School Worthington, Pa.	John H. McCoy	John H. McCoy	Harry E. Rose
Riverside Junior-Senior High School, R. D. 2, Country Club Drive, Ellwood City, Pa.	Edward C. Schaffer	Leslie H. Marietta	S. Robert Marziano
Knock Junior-Senior High School Saxonburg, Pa.	L. B. Derickson	Andrew Herceg	Keith Johns
Mars Area High School Mars, Pa.	Albert Manerino	John J. Dillon	Robert J. Simmons
Seneca Valley High School R. D. #1, Harmony, Pa.	Harris Reynolds	Frank Adamczyk	James Jamison
Shenango High School 2550 Ellwood Road New Castle, Pa.	Edwin C. Beatty	Anthony Venturella	Anthony Venturella
Western Beaver Junior-Senior High School R. D. 2, Industry, Pa.	Frank A. Meredith	Michael Arbutina	John W. Hineman
Mohawk Junior-Senior High School, Hoffmaster Road, Bessemer, Pa.	Manford E. Brockway	Herbert J. Edwards	John E. Samsa
Freedom Area Junior-Senior High School, Freedom, Pa.	John B. Wahl	Charles M. Gongloff	Thomas Skinner

AREA C

Mr. Frank Palaggo, Research Assistant

Brookville Area High School Brookville, Pa.	James L. Hysong	Fred Clarke	Kathryn Smith
Brockway Area High School Brockway, Pa.	Blair H. Rupert	C. Herbert Steel	Caroline Longwell
Clarion Area High School Liberty St., Clarion, Pa.	Herbert Schneider	L. Robert Wiberg	William Brochetti

School	Chief School Administrator	Principal	Project Coordinator
Clarion-Limestone H. S. R. D. #1, Strattanville, Pa.	M. M. Collett	Fred L. Carl	Richard Bailey
Keystone High School Knox, Pa.	Blaine E. Elder	Welton Austin	James Lines
North Clarion Co. H. S. Leeper, Pa.	Joseph Orlosky	Charles Jolley	William Gilbert
East-Forest High School Marienville, Pa.	Philip Wallace	John Smrek	Arthur VanNort
Redbank Valley H. S. New Bethlehem, Pa.	Joseph Kata	Richard Krepp	Twila Gruver
Union High School Rimersburg, Pa.	B. G. Corliss	D. H. Hiwiller	Norman Sherman
West Forest High School Tionesta, Pennsylvania	Philip Wallace	M. J. O'Toole	Adam Vlanich
Tidioute Junior-Senior H.S. Tidioute, Pa.	Charles Anderson	Charles Anderson	Charles Anderson

APPENDIX U

CENTER FOR EDUCATIONAL RESEARCH AND REGIONAL CURRICULUM DEVELOPMENT

CLARION STATE COLLEGE

CLARION, PENNSYLVANIA

FEBRUARY, 1967

CENTER FOR EDUCATIONAL RESEARCH
AND
REGIONAL CURRICULUM DEVELOPMENT

CLARION STATE COLLEGE

Clarion State College is located in the midwestern part of Pennsylvania which is a rural part of Appalachia. The rural scene of Appalachia was aptly described by the President's Appalachian Regional Commission as unique:

> Rural in Appalachia does not mean a checkerboard of rich farms; instead dense but narrow ribbons of bleak habitation wind along the valley roads and up the tributary hollows, threading among the wooded hills. It suggests, in fact, an endless town, but it is not a town, for typically there is no central water supply or disposal, no police station or fire house, no hospital or hotel, no streets or sidewalks, no shops or places of amusement.
>
> At intervals, where the valley broadens to a field size, the ribbon-town is interrupted by a true farm; at further intervals the ribbon thickens to what was once, still passes for, or truly is, a proper town.
>
> The streets, crowded with foot traffic and cars, actually reflect not a true vitality, but rather the unemployment and underemployment of the region. The sidewalks are crowded with men, women, and youth who have little else to do but to come to town and, once there, they have no place to congregate.[1]

The area in which Clarion State College is situated typifies the more sparsely populated, the isolated, and the economically disadvantaged parts of Appalachia. It is predominately rural nonfarm. Clarion County, the county in which the College is located, is only 13% urban (communities with population over 2,500), 12% rural farm and 75% rural nonfarm. This typifies the surrounding area. By comparison, 40% of Appalachia and 70% of the nation is urban.

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[1] Appalachia: A report of the President's Appalachian Regional Commission. U. S. Government Printing Office, Washington, D. C., 1964.

The region is relatively isolated and economically depressed. Causes of isolation which seem to prevail in this region are the mountainous terrain, the lack of roads, railroads or airplanes, the lack of money to travel, and the lack of involvement in interregional activities.

As the coal is mined out, the oil and gas are pumped out and the forests are cut; many people move away but few move in. This is the heart of the land that gave America its great industrial wealth through oil, coal and gas, now left impoverished. According to the 1960 census reports, there are fewer people (percentage) who had moved in from out-of-state to Pennsylvania than any other state in the nation. This area is one of the least affluent parts of Pennsylvania.

The mass exodus of the young adults from this area is reflected in declining birthrate. According to the Bureau of Statistics, Commonwealth of Pennsylvania, there were 891 live births in Clarion County in 1957, 682 in 1965 and a projected 560 for 1970. Venango County, adjacent to Clarion and home of the first drilled oil well in the world, had 1,522 live births in 1957, 1,050 in 1965, and a projected 780 in 1970, a decrease of about 50% in thirteen years.[2]

It is a widely known fact that areas which are in greatest need of federal assistance are least able to seek that assistance. Such is the case in this region. It is the more aggressive implementers of change who move away. The need for leadership is great. The struggle to turn the tide and to rebuild a dying part of America is complex and long-range. It calls for the effective mobilization and utilizations of the existing resources to greatest advantage. It calls for improved education of the people and the development of leadership among the local citizenry.

A public institution of higher education has responsibilities to the region it serves in addition to the academic training of youth. This is especially true in a region such as Clarion where leadership and professional resources are limited. Fully recognizing this fact, Clarion State College has established the Center for Educational Research and Regional Curriculum Development. This Center is designed to develop an integral relationship between the College and the Community; using the professional and research skills and resources of the College to strengthen the community, and the enriched learning opportunities in the community to strengthen the College.

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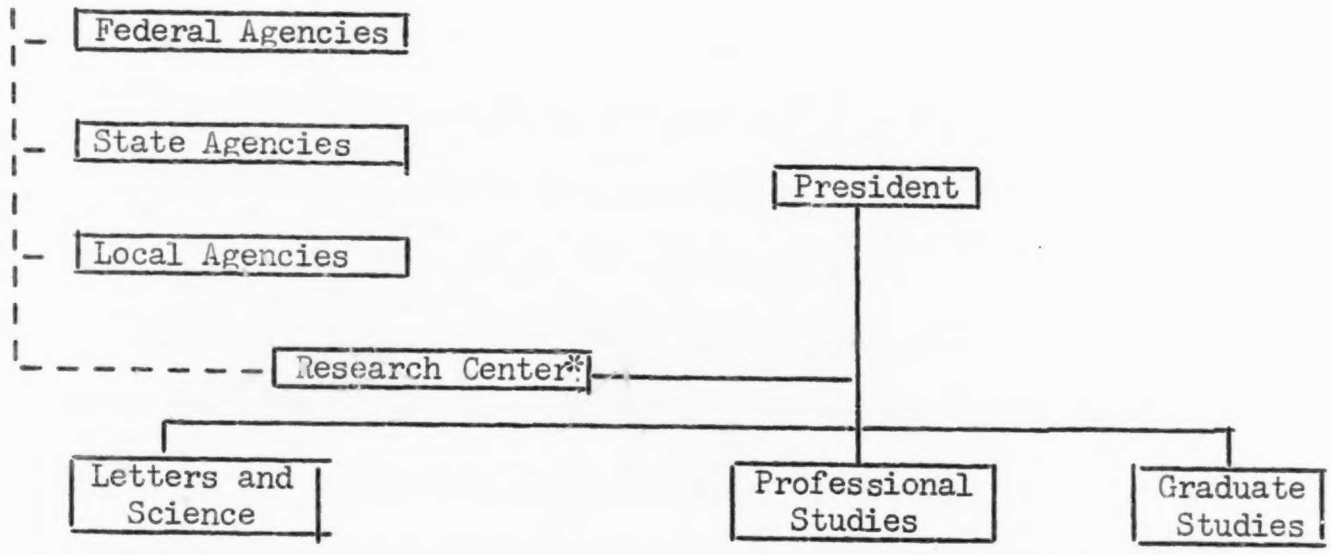
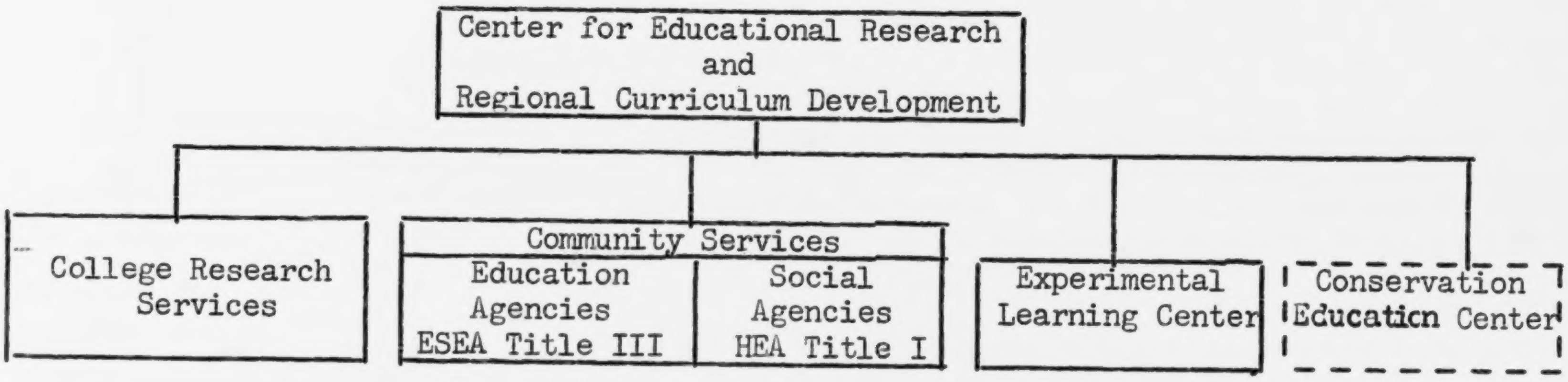
[2] Projections of Selected Educational Statistics for Pennsylvania to 1975-76. Bureau of Statistics, Commonwealth of Pennsylvania, Department of Public Instruction, Harrisburg, Pennsylvania, August 1966, p. 3.

The Center is structured in a "staff" role to provide services to the College and all divisions of the College, and to relate to appropriate federal, state and local agencies in relation to research and regional development.



* Center for Educational Research and Regional Curriculum Development

The internal structure of the Center is designed to coordinate college research services, community development services and other such services which interrelate between the college and the community. The developing structure of the Center as it is now visualized is shown below.


Center for Educational Research
and
Regional Curriculum Development
College Research Services
Community Services
Education Agencies ESEA Title III
Social Agencies HEA Title I
Experimental Learning Center
Conservation Education Center

The functions of the various sections of the Center should be flexible and adaptable to the changing needs and interrelate with each other as appropriate, and in general include the following major activities:

College Research Services. College research services include: (1) institutional research, conducting studies and preparing reports for the college administration and divisions of the college; (2) technical assistance to divisions, departments, and individuals of the college (i.e., developing plans for significant proposals, preparation and submission of applications, implementing the process of obtaining grants, and assistance in conducting grants when appropriate; (3) conducting research under grants appropriated to the Center.

Community Services. The types of services deemed appropriate for the Center to promote are those designated by the Bureau of Curriculum Planning, Department of Public Instruction, as responsibilities of the Area Curriculum Center (since this office is officially designated as the Area Curriculum Center for this region) and those suggested by the Priority List of Major Community Problems in Pennsylvania as established by the Higher Education Act Agency of the Bureau of Institutional Studies and Services, Department of Public Instruction.

The Area Curriculum Center's responsibilities are defined as follows:

1. To encourage, assist, implement, and coordinate increased cooperation among the college, offices of the county superintendents, local public school districts, professional agencies and associations and the Department of Public Instruction in identifying, planning, conducting, evaluating, and disseminating the results of curriculum development projects.
2. To exercise professional leadership and assistance in identifying, defining, developing, and reporting significant curriculum study and/or research projects designed to accelerate change in the public school program.
3. To give encouragement and lend professional assistance to the development and function of the various regional programs of the Commonwealth.

The major functions of the Center under the Higher Education Act Agency are: (1) the development of a system for gathering and organizing data relative to community problems and disseminating the information to appropriate action-oriented institutions and agencies for use in solution of specific community problems, (2) creation of demonstration research programs illustrating the use of the community service information center in the dissemination of information concerning the solution of specific community problems, and (3) utilization of the faculty and facilities of the College for the development and implementation of programs dealing with community-oriented problems to be conducted by appropriate institutions and agencies. The range of problems of concern are those outlined by the Higher Education Act Agency's "Priority List of Major Community Problems in Pennsylvania" (see Appendix A).

Experimental Learning Center. The Experimental Learning Center at Clarion State College is now in the planning stage. Architectual plans are now being prepared, with a target date for operation of September, 1969. The functions of the Experimental Learning Center are outlined in the Department of Public Instruction Report, "Program for Educational Requirements for Experimental Learning Centers in Colleges in Pennsylvania," in order of priority:

1. Research and experimentation with emphasis upon tryout and initial revision of the new curriculum materials and instructional methods and field testing of educational practices developed through experimentation either within the center or elsewhere, rather than upon what is commonly called pure or basic research, whether or not it is related to education.
2. Demonstration and development of improved educational practices in the geographic area by the respective institutions - or the promotion of new and improved methods.
3. Providing services to school systems in the respective college service area. This may be expected to take on the form of technical assistance to school systems and data processing services, testing and special consulting.
4. Teacher training.

The Experimental Learning Center at Clarion State College will focus upon significant educational problems of the region and the nation at all age levels (life span.)

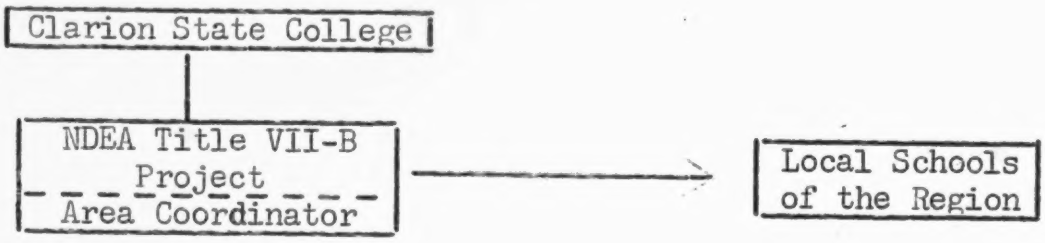
Conservation Education Center. The Conservation Education Center is being planned in conjunction with the Penn Soil Resource Conservation and Development Project. The Penn Soil project is designed to promote optimum land use of a one and a half million acre area in Crawford, Mercer and Venango counties. Through a cooperative effort by federal and state conservation agencies, this project is one of the most comprehensive ever undertaken in the nation. It will include planning for optimum use and management of soil, water, fish, wildlife, forests, flood control, recreation and industrial development.

In the process of planning this major undertaking, the Penn Soil group established a Conservation Education Center Committee to plan the development of a conservation education center in the heart of this one and a half million acre project. The committee selected and purchased a two hundred-acre site adjacent to an area which will become a seven thousand-acre state park at Sandy Creek. This committee has requested Clarion State College to accept responsibility of operating the Center, with full authority to make all decisions regarding its operation.

If the State Legislature and the Department of Public Instruction approves funds for this center, the College plans to operate it on a multi-purpose basis, providing year-around outdoor education programs for elementary and secondary students, as inservice and preservice experiences for elementary and secondary teachers, as a base station for our College and other colleges to observe and to conduct research in conservation practices; and as a national center for the promotion and dissemination of best conservation practices in cooperation with state and national conservation agencies and organizations.

The Development of the Center

In September, 1965, the U. S. Office of Education approved funds to extend a National Defense Education Act Title VII-B project at Clarion and Slippery Rock State Colleges for a second year.[3] This project on the use of programmed learning materials involved thirty school districts in the region and established a working relationship between the College and the local schools.



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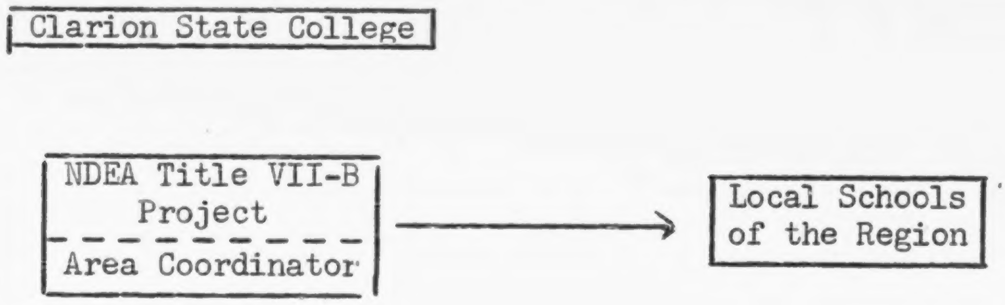
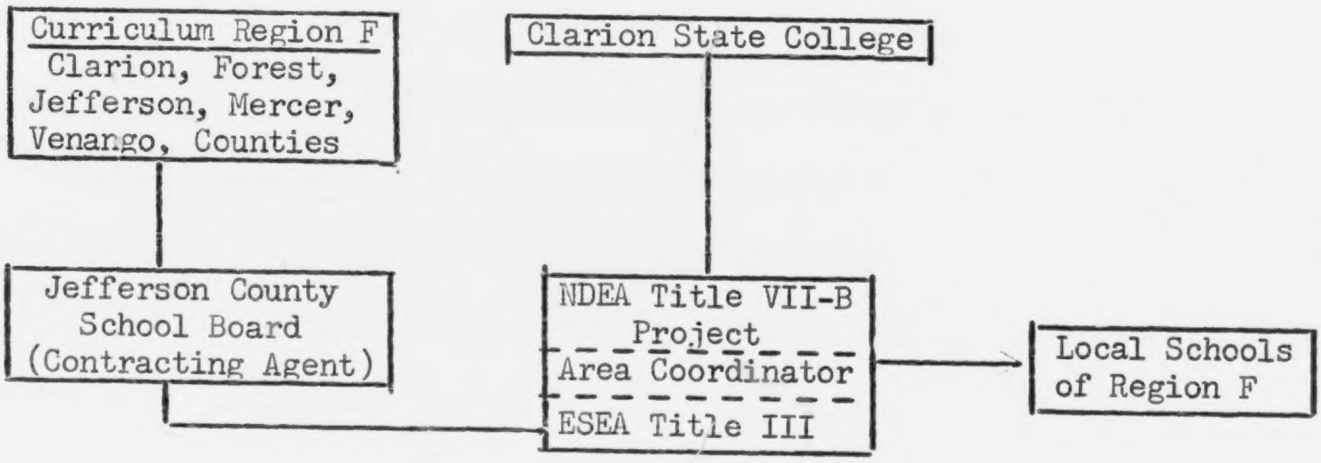
[1] Page, William and Hale, Nelson, Co-Investigators. Programmed Instruction for Superior Students in Small High Schools. Contract No. OE-4-16-026.

The Department of Public Instruction for the past several years has been developing the idea of using college resources to promote curriculum planning on a regional basis. Each of the state colleges was designated as an Area Curriculum Center with a specified region to serve. Clarion's area included five counties--Clarion, Forest, Jefferson, Mercer, and Venango. Each college president was invited to appoint someone from his college staff as Area Curriculum Coordinator at no additional salary. In most cases, the person appointed already had other full-time responsibilities; thus, relatively little regional curriculum planning was achieved.

At Clarion State College, the N.D.E.A. Title VII-B project director was named Area Curriculum Coordinator. Like coordinators of other colleges, he already had a full-time job. His particular responsibility, however, as Director of the Title VII-B project was working with the local schools. This extended responsibility not only helped achieve the purpose of the Area Curriculum Center but also helped enhance the Title VII-B project.



By November, 1965, it became apparent that local school administrators needed help with E.S.E.A. Title I. The project director and area coordinator therefore applied for funds under N.D.E.A. Title III for a series of inservice meetings in each of the five counties to help local administrators with this problem. This promoted the idea of regional planning, and a proposal was submitted for a regional planning grant for the five counties. The Title VII-B Project Director Area Coordinator was named Director of the E.S.E.A. Title III project (at no additional salary) in order to coordinate all the interrelated activities. Jefferson County submitted the project in the name of all five counties. The project was funded and provided two professional workers to assist the schools of the region to identify their needs and resources and to stimulate programs to use the resources to help meet the needs.

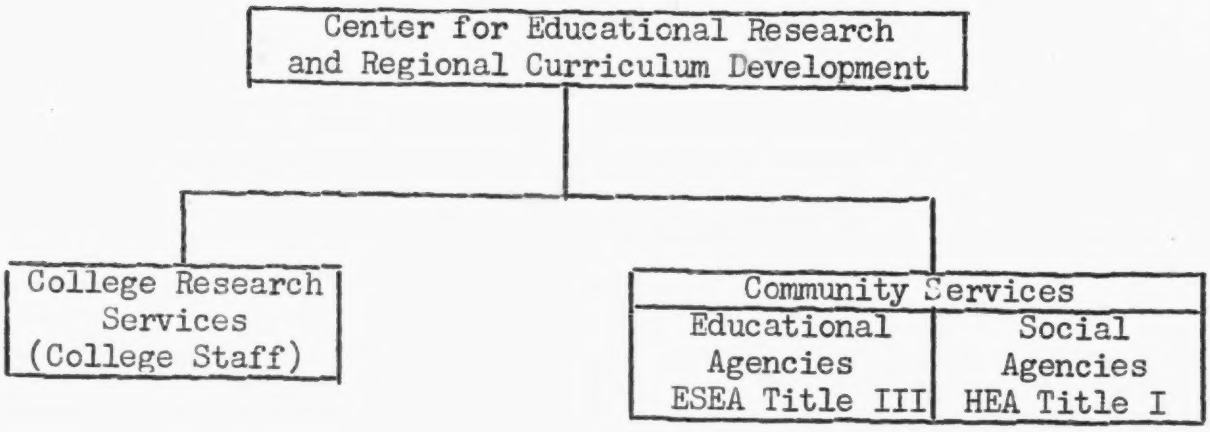

Curriculum Region F
Clarion, Forest, Jefferson, Mercer, Venango, Counties
Clarion State College
Jefferson County School Board (Contracting Agent)
NDEA Title VII-B Project
Area Coordinator
ESEA Title III
Local Schools of Region F

The most pressing problem of the region at the time the E.S.E.A. Title III regional planning project began was still E.S.E.A. Title I. A major effort therefore was extended to help local schools identify their needs and use E.S.E.A. Title I funds (a major resource) to meet these needs. Local schools needed four types of assistance:

1. Technical assistance in completing application forms.
2. Assistance in identifying needs and developing appropriate programs to help break the link between economic disadvantage and educational disadvantage.
3. Inservice programs to help teachers understand how educational problems relate to poverty and to help them conduct new programs being developed under Title I.
4. Assistance in evaluating Title I projects.

The first two types of assistance, technical assistance and program planning, could not be financed by E.S.E.A. Title I so these services were provided by the E.S.E.A. Title III planning staff. Costs for workshops and evaluations were included in the local E.S.E.A. Title I budgets. They were coordinated by the E.S.E.A. Title III staff.

As the general population became aware that college staff were helping local schools with federal programs, requests for assistance concerning many social problems were received. This matter was discussed with representatives from various social groups including the community action, health, welfare, and employment agencies. It was the concensus of opinion that there is a great need for assistance to the social agencies with federal projects in the same way E.S.E.A. Title III was helping with educational problems. A proposal was therefore submitted under Higher Education Act (HEA) Title I to provide such a project. It was funded and began operation in October, 1966. Again, in order to provide coordination of the total regional development, the person named to direct this project was the same as the director of the other projects. In each case, however, an associate director was named to actually direct the project. This procedure, however, tied the programs together. Also, in each case, no additional money was budgeted to the director who was already on full salary. At the same time the H.E.A. Title I project began, the N.D.E.A. Title VII-B project terminated. Clarion State College continued the N.D.E.A. Title VII-B staff positions on the college complement as college research staff. This established the Center for Educational Research and Regional Curriculum Development to unify the operations of the area curriculum center, college educational research, and the various federal projects. The present operating Development is as follows:


Center for Educational Research
and Regional Curriculum Development
College Research
Services
(College Staff)
Community Services
Educational
Agencies
ESEA Title III
Social
Agencies
HEA Title I

Since the basic purpose of this structure is to correlate and interrelate various federal programs, it is difficult to separate the activities as distinctly E.S.E.A. Title III, H.E.A. Title I, College, or even E.S.E.A. Title I since the Center is also evaluating Title I projects and employs staff to do this.

E.S.E.A. Title III Activities

The following activities directly related to regional planning with local schools were conducted as E.S.E.A. Title III functions.

1. Prepared a monograph explaining the purpose of E.S.E.A. Title I and the types of programs which need to be developed. (This was given statewide distribution by the Curriculum Planning Division of the Department of Public Instruction.)

2. Provided technical assistance to the schools of Region F and other schools on special request for preparing E.S.E.A. Title I applications, involving approximately $2,000,000.

3. Worked directly with local schools in E.S.E.A. Title I program development. Planned programs (and wrote applications) for local schools, involving $1,000,000.

4. Planned and presented seven three-week workshops for ten school districts, involving 350 teachers at a cost of $26,950 plus stipends for teachers, totaling $134,750.

5. Planned and directed the evaluation of E.S.E.A. Title I projects totaling $700,000. The cost for the evaluation was $33,600.

6. Currently helping local schools plan new E.S.E.A. Title I projects.

7. Developed a directory of all social agencies in Region F.

8. Assisted in the preparation of numerous E.S.E.A. Title III proposals.

9. Prepared proposal and served as delegate agency for an O.E.O. summer camp for 200 children at a cost of $69,000.

10. Sponsored a workshop for Headstart staff, the cost of which was paid by the Community Action Agency.

11. Assisted Community Action Agencies in planning numerous projects.

12. Is delegate agency in cooperation with the Special Education Department of three Headstart centers for physically and mentally handicapped children, for $28,800.

13. Planned the H.E.A. Title I project for $39,668.

14. Began a guide of community resources for field trips. This is not completed but will be continued under a new E.S.E.A. Title III planning grant.

15. Helped the Conservation Education Planning Committee plan the Center, including the planning of building needs and costs. The plans for the Conservation Education Center will be presented to the State Legislature during the current session at an estimated capital outlay of $1,000,000, plus and annual $100,000 budget for operation.

16. Provided speaker for many local, regional and state-wide groups to explain federal education programs.

17. Developed several projects with Camp Blue Jay Job Corps Camp.

H.E.A. Title I

Although the H.E.A. Title I project is still relatively new, a number of activities have been initiated.

1. A dinner meeting has been held in each of the five counties to announce the project and to solicit ideas for action. Invited to the meetings were representatives from health, welfare, employment agencies, county planning commissions, chambers of commerce, schools, the press and other key people of each county.
2. An information clearinghouse where local governmental and community leaders can obtain accurate information concerning sources of assistance through various state and federal programs is being developed.
3. A questionnaire to high school seniors and recent high school graduates is being prepared to determine need for an informational service regarding the transition from schools to work and from school to other training to provide marketable skills. This questionnaire is also being designed to reflect educational needs and resources of the region.

4. Manpower training possibilities are being studied. Attempts are being made to determine employment possibilities in the region and possible instructional resources for training programs. Some definite needs for skilled workers have been identified and the willingness for private companies to provide a training program has been indicated.

5. Working relationships are being established between this project and all the related agencies of the region. Fine cooperation and eagerness to work together is being expressed by all agency representatives.

6. Numerous requests for assistance have been made by various community agencies. The types of assistance requested include: jobs for high school students, programs for the aging, manpower training programs, assistance with sewer and water planning, evaluation of Community Action Agency projects, assistance in developing parks, conservation center, museums, juvenile delinquency prevention programs, mental health programs, etc. Most of these requests relate to the question: "How can we get some federal funds?"

7. An interagency conference to plan cooperative action programs was held January 29 and 30, 1967, with this project as host. This workshop was to solicit ideas and to give direction to project activities. Representatives from all governmental and social agencies of the region were invited. Consultants for the workshop include representatives from the Community Action Training Center, University of Missouri; Area Resource Development, Extension Center, Penn State University; the National Association for Community Development; and the Institute of Local Government of the Graduate School of Public and International Affairs, University of Pittsburgh and national leaders of the Office of Economic Opportunity.

8. Contacts are being established in the various federal offices to obtain guidelines and further information for follow-up activities related to requests for assistance.

APPENDIX A

MAJOR COMMUNITY PROBLEMS IN PENNSYLVANIA

I. Econimic Development to Accelerate State Growth

   A. Orientation of officials of professional organizations, service clubs, church and other community groups to understand the problems of poverty.

   B. Training of community leaders in how to help members of low-income groups to develop a desire for self-improvement.

   C. Orientation of the power structure in the community as to the problems of poverty and the means of their amelioration through the resources of the community.

   D. Preparation of information manuals translating into usable form the extensive research on regional economic development done since 1963, for use as a tool for community leadership.

   E. Development of and dissemination to community officials a plan for statewide and regional long range planning for economic development designed to assure continuation of current efforts after the 1971 expiration of the Appalachian Regional Commission.

   F. Conduct of problem-oriented leadership conferences for growth-potential areas involving participants from communities, institutions and state agencies.

   G. Development of new activities and services in the community to create new employment opportunities and thus strengthen the economy.

II. Human Resource Development and Utilization

   A. Development of personnel and programs to counsel and retrain agricultural and other workers moving to new areas and occupations.

   B. Development of improved methods of survey, analysis and dissemination of information on employment opportunities and the training of personnel in these methods to promote manpower development and training.

   C. Retraining of women with some college training to fill semi-professional community positions.

   D. Development of an interest and understanding of the history and development of ethnic groups among community leaders to aid in the resolution of racial and ethnic differences.

E. Provision of training for the unskilled to make them employable in developing community occupations and thus reduce skill obsolescence.

F. Presentation of training and/or educational efforts designed to develop sub-professional skills which will increasingly be in short supply, such as para-medical personnel, library technicians, and family service and neighborhood center personnel.

G. Development through action-oriented research of inventories of projected community requirements on the basis of current and projected labor needs.

H. Conduct of pilot projects on deliberate worker mobility program; designed to make under-employed and unemployed people aware of job opportunities in other communities and condition them to the changes involved.

III. Government Organization, Reorganization and Consolidation

A. Development of inter-county and regional cooperation, in financing, organizing and carrying out of community services and projects.

B. Survey of the adequacy of local government to solve community problems in such areas as organizational structure, service areas, financial resources, statutory powers and professional personnel required to facilitate reorganization.

C. Analysis of the applicability of municipal boundary commission concept to Pennsylvania in order to enable community officials to utilize most appropriate practices.

D. Conduct of community leadership programs on a regional basis to demonstrate the advantages of local government consolidation and reorganization and based on the Committee on Economic Development's 1966 Report on Modernizing Local Government.

E. Development and activation of an information clearinghouse where local governments and community leaders can obtain accurate information concerning sources of assistance available for purposes of upgrading the quality of local public services.

IV. Community Organization and Reorganization -- Private and Voluntary Sector

A. Conduct of regional instructional programs for adult community leaders in principles of youth development.

B. Training of community leaders in better utilization of existing facilities and upgrading of these to promote expansion of recreational and cultural development and utilization.

C. Action-oriented research on the financing and effectiveness of private, non-profit community organizations in the health, welfare, recreation, youth and senior citizen areas and application of the findings to the functioning of these organizations.

D. Analysis and demonstration of more effective means of collaboration between governmental and non-governmental community organizations for the pursuit of community development.

E. Offering of policy and management training leadership seminars for voluntary, non-profit community organizations, ranging from the traditional health, welfare and youth organizations to new community action agencies.

V. Development and Training of Elective and Professional Government Personnel

A. Orientation and training of elective and professional personnel in the development of human resources.

B. Development of a non-partisan political awareness program in the community through use of community leaders.

C. Establishment of relative roles of State government, local government, community leadership, public opinion and educational institutions in fostering professional development of local government officials and employees and application of the developed concept.

D. Conduct of issues and problem-oriented instructional programs by university faculty for elective officials (majors, councilmen, county commissioners) concerning topics of local and regional relevance.

E. Conduct of action-directed research dealing with local and regional needs for professional manpower in municipal and county governments designed to develop strategies for upgrading the professional competencies of their staffs.

VI. Orientation and Training of Professional and Educatioanl Personnel to the Problems of Community Development

A. Development of the method of using citizen orientation meetings to precede relocation of displaced families.

B. Orientation of the appropriate personnel in application of local codes and ordinances in harmony with Federal requirements.

C. The identification, definition and establishment of the interdependence among the segments of industry, the community and agriculture toward the solution of community problems.

D. Use of specialists from college faculties to conduct refresher and updating programs for secondary school teachers in the solution of selected community problems.

VII. Development of Transportation Systems to Maximize Economic and Human Development

A. Utilization of university faculty members to aid in the development of an understanding on the part of industrial and government officials and planners of the interdependence of the various segments of the state's transportation system and its overall development.

B. Promotion of conferences on the opportunities for cooperation between state, regional and local government agencies and private interests in the transportation industry in the development of a more effective statewide transportation system.

C. Development of demonstration research projects on the use of university faculty in cooperation with community and industrial leaders in promoting more effective urban transportation systems.

D. Conduct of university-sponsored conferences of representatives of the transportation industry and government officials to determine more effective means of interstate cooperation which will lead to strengthening the state's transportation system.

VIII. Problems of Physical and Mental Health in Pennsylvania, Including Problems of the Aging

A. Development of programs for use by mass media such as television, radio and publications for dissemination of information on physical and mental health.

B. Orientation of ministers, teachers and community workers in the principles of physical and mental health.

C. Presentation of training programs for community officials and workers in community problems of the aging particularly where this population segment predominates.

D. Presentation of demonstration research projects on cooperation among university faculties and community and state officials in the development of sound local and regional programs of physical and mental health.

IX. Natural Resources Conservation and Development (including air, land and water resources)

A. Conduct training programs for school science, social studies and other teachers in the proper use of natural resources.

B. Establishment of demonstration projects on conservation methods.

C. Prepare personnel to disseminate information on beautification of community areas, highways, the development of recreation areas.

C. Presentation of orientation and training for industrial and community leaders on the solution of problems pertaining to air and water pollution.

X. Community Planning and Design (housing, land use and urban renewal)

A. Orientation of planners in the influences of type of housing upon occupants outlook and civic response.

B. Development of a concept and application of a method of relating costs and benefits in low-cost housing.

C. Training of planners in socio-economic trends, population shifts and changing patterns of land use.

D. Conduct of training programs for community leaders in developing community beautification programs, industrial site selection, use of soil conservation practices and management of private residential land areas.

E. Conduct of demonstration research programs designed to illustrate present trends and emerging techniques in the analysis and solution of problems of urban renewal for elective local officials, community leaders and professional government administrators.

XI. Development of a System for Gathering and Organizing Data Relative to Community Problems and Disseminating This Information to Appropriate Action-oriented Institutions and Agencies for Use in Solution of Specific Community Problems.

A. Development and application of a method of relating housing needs and housing supply.

B. Review and evaluate the effectiveness of the activities of such organizations as planning commissions, welfare services and health and housing officials in gathering and organization of such data to improve such services.

C. Creation of demonstration research programs illustrating the use of a community service information center in the dissemination of information concerning the solution of specific community problems.

D. Utilization of the faculty and facilities of a collegiate institution for the development and implementation of an information system dealing with community oriented problems.